Equity of COVID-19-induced job loss duration

Swapnil Motghare[*]

November 8, 2022

PRELIMINARY AND INCOMPLETE

Abstract

I study COVID-19-induced job losses using administrative data on the universe of Unemployment Insurance claims for the state of Indiana. I show that during the pandemic, women and Blacks not only lost more jobs but also stayed unemployed longer. The differences in job loss duration for Black-whites are much bigger than men-women and a smaller portion of the gap is explained by observable characteristics. The differences in duration emerge due to later ending of the unemployment spell rather than early beginning consistent with the last hired but not with the first firing of Blacks during weak economic periods. The adverse effects of the COVID-19 recession for women and Blacks were thus worse than implied by only the job losses.

1 Introduction

The COVID-19 pandemic caused large job losses. U.S. unemployment rose to 14.8% in April 2020, the highest rate since the great depression high of 24.9% (Margo, 1993). An issue related to the pandemic that received large media attention was that women, Blacks and hispanics experienced a disproportionate share of job losses (Bateman and Ross, 2021; Cohen, 2021; Gould et al., 2020; Tedeschi and Bui, 2020). The disproportionate effect on women is opposite of what has been observed in previous downturns and has led to the COVID-19-induced recession being referred to as the "shecession" (Holpuch, 2020). This inequity in job loss incidence is largely attributed to the fact that women, Blacks, and hispanics are more likely to be employed in industries and occupations which suffered more from the pandemic. Additionally, for women, the closure of schools meant additional household care giving responsibilities due to children learning from home, termed as the "COVID motherhood penalty" (Fairlie et al., 2021).

In this paper I study a related aspect of job loss incidence - the job loss duration. I ask: Did women, Blacks, and hispanics suffer disproportionately during the pandemic in terms of unemployment duration?[1]

It is important to study job loss duration along with incidence as together they convey a more complete economic costs of job loss. If incidence of job loss and duration go in the same direction, then the economic costs of job loss were higher that implied by job losses only. If they go in opposite direction, the economic costs of job loss are smaller. Moreover, higher job losses do not necessarily imply higher duration. Large job losses can be associated with a lower duration if those who lost jobs went quickly back to their jobs.

To study the differences in job loss duration, I use administrative data on the universe of UI claims for the state of Indiana in 2020. These are individual-level panel data containing weekly UI payments information for half a million Indiana workers, about 16% of Indiana's labor force.

Comparing the total weeks of UI receipt in 2020 by demographic groups, which likely represents COVID-19-induced unemployment, I find higher duration of unemployment for women and Blacks: Women were unemployed for an extra 0.9 weeks (9%) as compared to men, while Blacks were unemployed for an extra 2.8 weeks (30%) as compared to whites. Interestingly, I find lower duration of unemployment for for hispanics compared to non-hispanics: Hispanics were unemployed for 0.5 (5%) fewer weeks compared to non-hispanics. To relate with the job loss literature, I calculate the ratio of UI recipients to labor force - UI incidence. I find higher incidence of UI receipt for women and Blacks as a proportion of labor force: Among those in the labor force, women were 1 percentage point more likely (=16%) to receive UI as compared to men, while Blacks were 8 percentage point

---

[1]I focus on gender, race and ethnicity as I feel these are more important than industry, occupation and education. Also, the data for industry and occupation are available at a point in time only which limits the scope of the analysis if workers change industry or occupation.

more likely (=22%) to receive UI as compared to whites. here too, the results for Hispanics are opposite. Hispanics were 7 percentage point lower to receive UI. Thus, the inequity in job loss incidence by gender and race, established by previous literature, is evident in job loss duration too. The results for hispanics are opposite. The differences in job loss duration for Black-whites are much bigger than men-women. The relatively modest effects by gender are consistent with Goldin (2022).

I show that total weeks of unemployment in 2020 is likely to be one duration rather than multiple instances of unemployment.

Exploring the determinants of the duration, I find that the differences in duration emerge due to later ending of the unemployment spell rather than early beginning. This is consistent with the last hired but not with the first firing of Blacks during weak economic periods examined in Freeman et al. (1973) and Couch and Fairlie (2010). Industry and occupation characteristics, the two leading reasons for disproportionate job losses, explain around 37% of the men-women gap and 17% of white-Black gap. Moreover, at least 11% of the difference in men-women duration and 64% of the difference in white-black duration persist after accounting for differences in industry, occupation, age, location, and pre-separation wage. The difference in duration is larger for women likely to have childcare responsibilities which suggest that childcare responsibilities likely played a role in the longer unemployment duration of women.

One mechanism that is likely correlated with duration is the nature of job loss. Arguably, temporary layoffs are associated with shorter duration than permanent layoffs. I show this and then study how much of the discrepancy can be explained by nature of layoffs.

One of the reasons the duration differences can arise relates to the type of job loss. It is reasonable to believe that if a job loss is temporary, the recall is likely to be faster and hence the job duration is shorter.[2] On the other hand, if job loss is permanent, workers have to look for a new job which is likely going to take longer than recall. This is what is seen in the data as those who were working with the same employer by Q4 of 2020 as in Q1 of 2020, we unemployed for 7.83 weeks much smaller than those that were working with a different employer (11.1 weeks). Among Blacks working in Q1 of 2020, 50% were working with the same employer, only two thirds of number of whites. 27.5% were working with a different employer and 22.5 % were not working, 17 and 16 for whites. This suggests that blacks were more likely to suffer permanent job loss than whites, which might be one of the reasons for longer duration.

The paper is related to literature on the labor market effects of recessions that has well documented heterogeneous impacts by gender and race. During the great recession, men suffered severely as compared to women while Blacks suffered severely as compared to whites (Hoynes et al., 2012).

---

[2]hal (2022) shows that the sudden increase and rapid recovery of unemployment during the COVID-19 were driven primarily by temporary layoffs.

While COVID-19 is different from other recessions in terms of its length and underlying causes, the impacts of the COVID-19 recession on different races are similar to those of previous recessions (Cortes and Forsythe, 2020; Couch et al., 2020).[3] Interestingly, the gendered impacts are opposite: Women fared worse during COVID-19 due to their employment in industries and occupations severely affected by the pandemic as well as increased childcare needs (Albanesi and Kim, 2021; Alon et al., 2020, 2021, 2022; Cajner et al., 2020; Deryugina et al., 2021; Fairlie et al., 2021; Furman et al., 2021; Garcia and Cowan, 2022; Hansen et al., 2022; Montenovo et al., 2020). In a more recent analysis, Goldin (2022) shows that the disproportionate effects on women during the pandemic depends on the counterfactual used. The paper notes that "The pandemic downturn was "she-cession" relative to other recessions and relative to the January (or February) 2020 figure. But gender differences month by month in employment outcomes, relative to pre-pandemic level, are not large. The big differences are by education rather than gender, and that makes it more similar to previous recessions." The variation in the duration of unemployment by gender and race remains an understudied aspect of COVID-19 job losses.

This paper complements the literature on the labor market effects of recessions by showing that during the COVID-19 recession, women and Blacks not only lost more jobs but also stayed unemployed longer. Thus, the adverse effects or economic cost of the COVID-19 recession on these groups were worse than implied by only the job losses considered in the existing literature.

The longer duration for women and Blacks, combined with higher incidence, is consistent with the larger job loss findings.

The results enrich our understanding of the unequal effects of the COVID-19 pandemic on the labor market. This is useful while designing policies to stabilize labor markets during downturns by targeting policies to reach the most affected population. The analysis also helps understand the appropriateness of using UI claims data as a proxy for unemployment.

The paper does not focus on the mechanism of these differences. The difference could be due to demand or supply side factors. For example, hispanics may have had shorter duration because they could not afford to stay unemployed (supply side) or it took them a longer time to find new jobs (demand side) While we cannot disentangle these, Ihope future research sheds more light on hich factors were prominent.

2 Data

The main source of data for this study is the universe of weekly Unemployment Insurance (UI) claims in the state of Indiana between January 2020 - July 2021. These are administrative data

---

[3]As per National Bureau of Economic Research (2021), the COVID-19 recession lasted only two months (March and April 2020). The decrease in economic activity was more due to the fear of a disease rather than structural issues in the economy.

provided by the Indiana Department of Workforce Development, the state agency that administers UI in Indiana. The individual and week level data includes information such as the amount of UI benefits paid, demographic characteristics (age, gender, race), industry, occupation, and geographic location of UI recipients.[4] For each payment, I observe if it includes any deductions are made. I also observe the wage before getting unemployed, and whether the recipient joins the pre-separation employer after ending an unemployment spell. The data only contain payments made under regular UI and not all the programs introduced through CARES Act.[5] I discuss more details of the data in Appendix B. The data on labor force by gender and race, employment by industry and occupation and the monthly number of unemployed comes various programs of the U.S. Bureau of Labor Statistics (Geographic Profile of Employment and Unemployment, Occupational Employment and Wage Statistics, Quarterly Census of Employment and Wages, and Local Area Unemployment Statistics).

For the analysis, I focus on data for 2020 since these reflect the period when the COVID-19 effects were strongest. More than 550,000 workers received UI benefits for at least one week in this period which is around 16% of the total labor force in January 2020. The total benefit amount distributed was more than \$3 billion ($\approx$ \$5,500 per worker). The demographic, industry and occupational characteristics for the recipients are shown in Table 1. Women constitute 48% of recipients, Whites constitute 77% while Blacks constitute 13%. The largest proportion of recipients are from manufacturing industry (32%), followed by Accommodation and Food Services (13%), Health Care and Social Services (11%), and Retail Trade (9%). Largest proportion of recipients are from production occupations (18%), followed by Office and Administrative Support Occupations (13%), Management Occupation (12%), and Food Preparation and Serving Related Occupations (10%). Age group 25-34 and 35-44 constitute 46% of recipients. The largest share of recipients, 26%, are from the region 5, that also contains the state capital. The average annual earnings is \$39,876 and the average weekly benefit amount is \$562. For comparison, the median household income in Indiana in 2019 was \$56,303 and the per capita income was \$29,777 (U.S. Census Bureau, 2019). The average annual wage and hence benefit amounts are smaller for women and Blacks as compared to men and whites respectively (Appendix B).

Table 1: Recipient characteristics

	Count	Proportion
Gender		
Women	262,946	0.48
Race		
White	427,292	0.77
Black	74,576	0.13
Asian	15,981	0.03
American Indian or Alaska Native	2,170	0.00
Hawaiian Native or Pacific Islander	798	0.00
Other	33,179	0.06
Ethnicity		
Hispanic	27,777	0.05
Industry		
Manufacturing	171,910	0.32
Accommodation and Food Services	65,922	0.12
Health Care and Social Services	55,822	0.10
Retail Trade	45,981	0.09
Admin./ Support / Waste Mgt. / Rem. Services	43,033	0.08
All other	155,942	0.29
Occupation		
Production Occupations	99,147	0.18
Office and Administrative Support Occupations	73,456	0.13
Management Occupations	66,040	0.12
Food Preparation and Serving Related Occupations	53,169	0.10
Sales and Related Occupations	34,900	0.06
Construction and Extraction Occupations	37,302	0.07
All other	189,934	0.34
Age group		
16-24	70,998	0.13
25-34	139,973	0.25
35-44	118,428	0.21
45-54	108,501	0.20
55-64	90,561	0.16
Region		
Region 1 (North)	61,514	0.11
Region 2 (North)	66,034	0.12
Region 3 (North)	71,285	0.13
Region 4 (North)	44,432	0.08
Region 5 (Central)	144,839	0.26
Region 6 (East)	23,906	0.04
Region 7 (West)	13,892	0.03
Region 8 (South)	17,677	0.03
Region 9 (South)	28,191	0.05
Region 10 (South)	19,762	0.04
Region 11 (South)	34,090	0.06

Table 2: Job loss severity

Group	UI recipients	weeks	Labor force	Recipients/Labor force
Men	293,523	9.74	1,806,500	0.16
Women	265,090	10.52	1,581,500	0.17
White	431,720	9.73	2,903,000	0.15
Black	75,476	12.68	318,000	0.24
Other	52,579	9.50	167,000	0.31
Not Hispanic	531,749	10.13	3,114,000	0.17
Hispanic	28,026	9.63	274,000	0.10

3 COVID-19-induced job losses

3.1 Gender and race

Table 2 shows that women were 1 percentage point more likely to receive UI benefit, unemployed for an extra 0.9 weeks, and 2 percentage point more likely to suffer a layoff as compared to men. A total of 270,993 men received benefits in 2020, which is 15% of their labor force in 2019. Similarly, a total of 251,009 women received benefits in 2020, which is 16% of their labor force in 2019.[6] For men, the average weeks of UI receipt was 9.5, while for women, the average weeks was 10.4. For men, 27% of the job losses were likely to be layoffs, as compared to 29% for women. Thus women have a higher incidence of UI receipt, duration of unemployment and likelihood of a layoff as compared to men.

Table 2 shows that Blacks were 8 percentage point more likely to receive UI benefit, unemployed for an extra 2.8 weeks, and 1.8 times more likely to suffer a layoff as compared to whites. A total of 400,906 whites received benefits in 2020, which is 14% of their labor force in 2019. Similarly, a total of 70,096 Blacks received benefits in 2020, which is 22% of their labor force in 2019. For whites, the average weeks of UI receipt was 9.6, while for Blacks, the average weeks was 12.4. For whites, 26% of the job losses were likely to be layoffs, as compared to 46% for Blacks, an increase of 1.8 times. Thus Blacks have a higher incidence of UI receipt, duration of unemployment and likelihood of a layoff as compared to whites.

How does UI incidence relate to unemployment rate? If all unemployed receive UI, the incidence will exactly equal unemployment rate. Past research has found that incidence is lower than unemployent because not all unemployed receive UI. The gaps emerge due to difference in rate of applying and

---

[4]The geographic location is available at the Economic Growth Region (EGR) level. All the 92 counties in Indiana are grouped into 11 Economic growth regions (EGR) based on economic and social ties, specifically commuting patterns, demographics, and other quantifiable factors (Indiana Nonprofits Project, 2007).

[5]I observe FPUC (extra $600 between May 2020 - July 2020) and CAUWA (extra $300 between January 2021 - March 2021) payments but not LWA (extra $300 in September 2020) payments. I also do not observe payments made under PEUC (extension of 13 weeks) or PUA (payments made to self employed and others not typically covered in UI).

[6]The time variation in incidence is shown in Appendix B.5

receiving UI conditional on application. More importantly, these differences vary by gender, race, and ethnicity. Past evidence during non-recessionary times suggests that unemployed women are less likely to receive UI benefits as compared to unemployed men (U.S. Bureau of Labor Statistics, 2020a).[7] There is also evidence that shows that unemployed Blacks are less likely to receive UI benefits as compared to unemployed whites (Gould-Werth and Shaefer, 2012; Kuka and Stuart, 2021; Skandalis et al., 2022).[8] Similar differences were also observed during the great recession (Nichols and Simms, 2012). An exception is U.S. Bureau of Labor Statistics (2020a), that does not find racial differences in application or receipt of UI benefits for UI applicants in 2018. During the COVID-19 pandemic, Black workers were more likely to be unemployed but less likely to get unemployment benefits (ProPublica, 2020).[9] Similar White-Black and Hispanic-non-hispanic gap are shown in Mar et al. (2022) Taken together, it is likely that the ratio of UI recipients to labor force is likely an underestimate of true unemployment rate and that the bias is bigger for women and Blacks as compared to men and whites respectively.

Hispanics are less likely to receive UI compared to non-hispanics due to lower rates of application and higher rejection rate (Skandalis et al., 2022).

Table 3: UI start and end dates

Group	Avg. start date	Avg. end date
Men	2020-05-16	2020-08-17
Women	2020-05-16	2020-08-12
Black	2020-05-30	2020-09-15
Other	2020-05-24	2020-08-17
White	2020-05-12	2020-08-09
Hispanic	2020-05-19	2020-08-13
Not Hispanic	2020-05-16	2020-08-15

The longer duration could be either due to differences in the beginning of unemployment spell or end or both. Table 3 shows that the average start date of receiving UI benefits is similar for men and women, but the average end date is later for women. For Blacks, both the average start and end dates are later as compared to whites, but the difference between end dates is much larger.[10] This is consistent with the last hired but not with the first fired explanation proposed in Freeman et al. (1973) and examined in Couch and Fairlie (2010).[11]

---

[7]The difference arising due to a lower likelihood of women to apply for benefits and not in receiving benefits conditional on application.

[8]The difference arising due to a lower likelihood of Blacks applying for the benefit and receiving benefit conditional on application.Skandalis et al., 2022 finds Black application rates to be lower only for 2005 and not when focusing on the larger time period (2002-2017).

[9]Carey et al. (2021) finds that application and receipts rates as a proportion of *population* were only different for Blacks and not for women.

[10]Interestingly, the average start dates are in May 2020. Thus is because the distribution of starts is skewed to the right skewing the average to the right. Some of this could be because a lag between unemployment and UI receipt but this also indicates that a lot of workers started unemployment spells in later half of 2020.

[11]Slow recovery of employment among Blacks is also documented in Montenovo et al. (2020).

How much of the differences in duration can be explained by observables? To analyze this, I study the differences in duration using a regression framework controlling for observables. I estimate regression of the following form

$$total\_weeks_i = \beta_0 + \beta_1 women_i + X_i\alpha + \epsilon_i \tag{1}$$

The term $total\_weeks_i$ is the total weeks of unemployment in 2020 for worker i, $women_i$ is an indicator variable that turns 1 if the worker i is women, X_i is a vector of observables that control for differences in industry, occupation, age, wage and geographic location of the individuals. The coefficient of interest is β_1 that indicates the difference in total weeks of unemployment between women and men after controlling for observables. It is not causal estimate but indicates how much of the difference in duration remains after controlling for observable differences.

Table 4: Unemployment duration explained by observables - Gender

	(1) weeks	(2) weeks	(3) weeks	(4) weeks
Women	0.76***	0.57***	0.20***	0.27***
	(0.02)	(0.02)	(0.02)	(0.03)
Wage quartile			-1.11***	-1.01***
			(0.01)	(0.01)
Constant	9.82***			
	(0.02)			
Observations	552,850	552,850	552,701	499,028
Industry, Occupation FE		X	X	X
Age FE			X	X
Location FE			X	X
Race and ethnicity FE				X
R-sq	0.00	0.07	0.10	0.10

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Estimates for coefficients of equation 1. The dependent variable is total weeks of UI receipt in 2020.

The coefficients in Model 1 of Table 4 suggest that men were unemployed for 9.49 weeks and women are unemployed for an extra 0.91 weeks or 9% longer than men. Since industry and occupation has been proposed as the two leading reasons for this difference, in Model 2, I add industry and occupation fixed effects.[12] Adding these fixed effects reduces the coefficient in magnitude but it remains positive and statistically significant. Thus, even after accounting for differences in occupation and industry, women stay unemployed longer by 0.57 weeks. Alternatively, industry and occupation can explain only 37% of the gap. In Model 3, I additionally control for the pre-separation wage quartile, age, location fixed effects. The difference in weeks is now only 0.10 weeks. Thus almost 11% of the difference in the duration cannot be explained by observables. There is considerable heterogeneity by race of the women as can be seen from estimates in Model 4 where the women indicator is interacted with race. Black women have are unemployed for 2.35 weeks longer than men.

To study residual duration for different races after controlling for observables, I estimate equation 1

---

[12]Cortes and Forsythe (2020) show the distribution of women and Blacks in industries and occupations more severely affected by the pandemic.

Table 5: Unemployment duration explained by observables - Race

	(1) weeks	(2) weeks	(3) weeks	(4) all2_race
Black	3.00***	2.55***	2.00***	2.02***
	(0.03)	(0.03)	(0.03)	(0.03)
Asian	-0.35***	-0.21**	-0.50***	-0.47***
	(0.07)	(0.06)	(0.06)	(0.07)
American Indian or Alaska Native	0.24	0.10	0.09	0.20
	(0.17)	(0.17)	(0.17)	(0.18)
Hawaiian Native or Pacific Islander	-0.06	-0.38	-0.23	-0.34
	(0.29)	(0.28)	(0.27)	(0.30)
NA or Other	-0.22***	-0.42***	-0.24***	0.62***
	(0.05)	(0.04)	(0.04)	(0.06)
Wage quartile			-1.05***	-1.01***
			(0.01)	(0.01)
Constant	9.80***			
	(0.01)			
Observations	553,996	553,996	553,847	499,028
Industry ,Occupation FE		X	X	X
Age FE			X	X
Location FE			X	X
Gender and ethnicity FE				X
R-sq	0.02	0.08	0.11	0.10

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Estimates for coefficients of equation 1with *women* replaced by race indicators. The dependent variable is total weeks of UI receipt in 2020.

by replacing $women_i$ with a vector of indicators for race. The coefficients of Model 1 in in Table 5 suggest that Blacks were unemployed for an extra 2.88 weeks as compared to whites. Controlling for industry and occupation in Model 2, Blacks remained unemployed for 2.38 weeks longer. Industry and occupation can explain only 17% of the gap. In Model 3, I additionally control for the pre-separation wage quartile, age, location fixed effects. The difference in weeks is now about 1.87 weeks. Thus almost 64% of the difference in the duration cannot be explained by observables.

The longer unemployment duration for women and Blacks indicate that the inequity in job loss, established by previous literature, is evident in job loss duration too. The adverse effects of the COVID-19 recession were thus worse than implied by only the job losses. The longer duration is a result of later ending of the unemployment spell rather than early beginning. The differences in duration are much bigger for Black-whites than men-women, and at least 20% of the difference persists after accounting for differences in industry, occupation, age, location, and pre-separation wage.

4 Conclusion

I study COVID-19-induced job losses using administrative data on the universe of Unemployment Insurance claims for the state of Indiana. While the literature has studied the inequity in job loss incidence, I focus on job loss duration. I show that women and Blacks not only lost more jobs in the COVID-19 pandemic but also remained unemployed for a longer duration. Thus, the disproportionate effects of the pandemic were even worse than what has been implied in the literature studying job losses.

Table 6: Unemployment duration explained by observables - Ethnicity

	(1) weeks	(2) weeks	(3) weeks	(4) weeks
Hispanic	-0.52***	-0.56***	-0.45***	-0.55***
	(0.05)	(0.05)	(0.05)	(0.06)
Wage quartile			-1.12***	-1.01***
			(0.01)	(0.01)
Constant	10.20***			
	(0.01)			
Observations	553,996	553,996	553,847	499,028
Industry ,Occupation FE		X	X	X
Age FE			X	X
Location FE			X	X
Gender and race FE				X
R-sq	0.00	0.06	0.10	0.10

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Estimates for coefficients of equation 1with *women* replaced by hispanic ethnicity indicator. The dependent variable is total weeks of UI receipt in 2020.

The expiration of FPUC($600) and LWA($300) benefits is associated with sharp reductions in the aggregate number of UI recipients. Using difference-in-difference estimation strategy, I find that exit rates from unemployment increase after benefit expiration and the increase is proportional to the magnitude of loss in benefit amount but in the opposite direction. A change in benefit amount by $300 is associated with a 30-35% change in exit rate in unemployment opposite direction. The small magnitude of effect highlights the need to study other reasons for the labor shortage in early 2021 such as exit from the labor force, childcare and health concerns, and changing worker preferences.

References

(2022). The unemployed with jobs and without jobs. *Labour Economics*, 79:102244.

Albanesi, S. and Kim, J. (2021). Effects of the covid-19 recession on the us labor market: Occupation, family, and gender. *Journal of Economic Perspectives*, 35(3):3–24.

Alon, T., Coskun, S., Doepke, M., Koll, D., and Tertilt, M. (2021). From Mancession to Shecession: Women's Employment in Regular and Pandemic Recessions. Working Paper 28632, National Bureau of Economic Research.

Alon, T., Doepke, M., Manysheva, K., and Tertilt, M. (2022). Gendered impacts of covid-19 in developing countries. IZA Discussion Paper 15013, Institute of Labor Economics (IZA), Bonn.

Alon, T., Doepke, M., Olmstead-Rumsey, J., and Tertilt, M. (2020). This Time It's Different: The Role of Women's Employment in a Pandemic Recession. Working Paper 27660, National Bureau of Economic Research.

Bateman, N. and Ross, M. (2021). Why has COVID-19 been especially harmful for working women? https://www.brookings.edu/essay/why-has-covid-19-been-especially-harmful-for-working-women/.

Cajner, T., Crane, L. D., Decker, R. A., Grigsby, J., Hamins-Puertolas, A., Hurst, E., Kurz, C., and Yildirmaz, A. (2020). The U.S. Labor Market during the Beginning of the Pandemic Recession. Working Paper 27159, National Bureau of Economic Research.

California Policy Lab (2022). Disparities in Access to Unemployment Insurance During the COVID-19 Pandemic: Lessons from U.S. and California Claims Data. Technical report.

Carey, P., Groen, J. A., Jensen, B. A., Polivka, A. E., and Krolik, T. J. (2021). Applying for and receiving unemployment insurance benefits during the coronavirus pandemic. *Monthly Labor Review*.

Cohen, P. (2021). Recession With a Difference: Women Face Special Burden. https://www.nytimes.com/2020/11/17/business/economy/women-jobs-economy-recession.html. Retrieved on July 24, 2021.

Coibion, O., Gorodnichenko, Y., and Weber, M. (2020). Labor Markets During the COVID-19 Crisis: A Preliminary View. Working Paper 27017, National Bureau of Economic Research.

Cortes, G. M. and Forsythe, E. C. (2020). The Heterogeneous Labor Market Impacts of the Covid-19 Pandemic.

Couch, K. A. and Fairlie, R. (2010). Last hired, first fired? Black-white unemployment and the business cycle. *Demography*, 47(1):227–247.

Couch, K. A., Fairlie, R. W., and Xu, H. (2020). Early evidence of the impacts of COVID-19 on minority unemployment. *Journal of Public Economics*, 192:104287.

Deryugina, T., Shurchkov, O., and Stearns, J. (2021). Covid-19 disruptions disproportionately affect female academics. *AEA Papers and Proceedings*, 111:164–68.

Fairlie, R. W., Couch, K., and Xu, H. (2021). The evolving impacts of the covid-19 pandemic on gender inequality in the u.s. labor market: The covid motherhood penalty. Working Paper 29426, National Bureau of Economic Research.

Forsythe, E. (2021). Understanding unemployment insurance recipiency during the covid-19 pandemic.

Freeman, R. B., Gordon, R. A., Bell, D., and Hall, R. E. (1973). Changes in the Labor Market for Black Americans, 1948-72. *Brookings Papers on Economic Activity*, 1973(1):67–131.

Furman, J., Kearney, M. S., and Powell, W. (2021). The Role of Childcare Challenges in the US Jobs Market Recovery During the COVID-19 Pandemic. Working Paper 28934, National Bureau of Economic Research.

Ganong, P., Greig, F., Liebeskind, M., Noel, P., Sullivan, D., and Vavra, J. (2021). Spending and job search impacts of expanded unemployment benefits: Evidence from administrative micro data. *University of Chicago, Becker Friedman Institute for Economics Working Paper*, (2021-19).

Ganong, P., Noel, P., and Vavra, J. (2020). US unemployment insurance replacement rates during the pandemic. *Journal of Public Economics*, 191:104273.

Garcia, K. S. D. and Cowan, B. W. (2022). The impact of school and childcare closures on labor market outcomes during the covid-19 pandemic. Working Paper 29641, National Bureau of Economic Research.

Goldin, C. (2022). Understanding the Economic Impact of COVID-19 on Women. *Brookings Papers on Economic Activity*.

Gould, E., Perez, D., and Wilson, V. (2020). Latinx workers—particularly women—face devastating job losses in the covid-19 recession.

Gould-Werth, A. and Shaefer, H. L. (2012). Unemployment Insurance participation by education and by race and ethnicity. *Monthly Lab. Rev.*, 135:28.

Hansen, B., Sabia, J. J., and Schaller, J. (2022). Schools, job flexibility, and married women's

labor supply: Evidence from the covid-19 pandemic. Working Paper 29660, National Bureau of Economic Research.

Holpuch, A. (2020). The 'shecession': why economic crisis is affecting women more than men. https://www.theguardian.com/business/2020/aug/04/shecession-coronavirus-pandemic-economic-fallout-women.

Hoynes, H., Miller, D. L., and Schaller, J. (2012). Who Suffers during Recessions? *Journal of Economic Perspectives*, 26(3):27–48.

Huang, B. T. I. S. (2020). Why Indiana's unemployment system is so troubled. https://eu.indystar.com/story/money/2020/11/16/indiana-unemployment-system-troubled/3712916001/. Retrieved on July 24, 2021.

Indiana Nonprofits Project (2007). Economic Growth Regions.

Institute for Women's Policy Research (2018). The Economic Status of Women in Indiana. Technical report.

Kuka, E. and Stuart, B. A. (2021). Racial inequality in unemployment insurance receipt and take-up. Working Paper 29595, National Bureau of Economic Research.

Landergan, K. (2021). America's unemployment system failed when it was needed most. Can it be fixed? https://www.politico.com/news/2021/05/19/america-unemployment-system-failed-pandemic-483100.

Mar, D., Ong, P., Larson, T., and Peoples, J. (2022). Racial and ethnic disparities in who receives unemployment benefits during COVID-19. *SN Business & Economics*, 2(8).

Margo, R. A. (1993). Employment and unemployment in the 1930s. *Journal of Economic Perspectives*, 7(2):41–59.

Montenovo, L., Jiang, X., Rojas, F. L., Schmutte, I. M., Simon, K. I., Weinberg, B. A., and Wing, C. (2020). Determinants of Disparities in Covid-19 Job Losses. Working Paper 27132, National Bureau of Economic Research.

National Bureau of Economic Research (2021). Business Cycle Dating Committee Announcement July 19, 2021. https://www.nber.org/news/business-cycle-dating-committee-announcement-july-19-2021.

Nichols, A. and Simms, M. (2012). Racial and Ethnic Differences in Receipt of Unemployment Insurance Benefits During the Great Recession. https://www.urban.org/research/publication/racial-and-ethnic-differences-receipt-unemployment-insurance-benefits-during-great-recession. Retrieved on July 24, 2021.

ProPublica (2020). Black Workers Are More Likely to Be Unemployed but Less Likely to Get Unemployment Benefits. `https://www.propublica.org/article/black-workers-are-more-likely-to-be-unemployed-but-less-likely-to-get-unemployment-benefits`.

Skandalis, D., Marinescu, I., and Massenkoff, M. N. (2022). Racial inequality in the u.s. unemployment insurance system. Working Paper 30252, National Bureau of Economic Research.

Tedeschi, E. and Bui, Q. (2020). Unemployment Tracker: Job Losses for Black Workers Are Deepening. `https://www.nytimes.com/interactive/2020/05/13/upshot/coronavirus-america-job-losses-slowing-tracker.html`.

U.S. Bureau of Labor Statistics (2020a). Characteristics of Unemployment Insurance Applicants and Benefit Recipients - 2018. `https://www.bls.gov/news.release/uisup.nr0.htm`. Retrieved on July 24, 2021.

U.S. Bureau of Labor Statistics (2020b). Effects of COVID-19 Pandemic on the Employment Situation News Release and Data. `https://www.bls.gov/covid19/effects-of-covid-19-pandemic-and-response-on-the-employment-situation-news-release.htm`.

U.S. Bureau of Labor Statistics (2020c). Frequently asked questions: The impact of the coronavirus (COVID-19) pandemic on The Employment Situation for April 2020. `https://www.bls.gov/cps/employment-situation-covid19-faq-may-2020.pdf`.

U.S. Census Bureau (2019). QuickFacts: Indiana. `https://www.census.gov/quickfacts/IN`.

U.S. Department of Labor. Questions and Answers: Federal Pandemic Unemployment Compensation (FPUC) Program. `https://wdr.doleta.gov/directives/attach/UIPL/UIPL_15-20_Change_1_Attachment_1.pdf`.

Wandner, S. A. and Stettner, A. (2000). Why are many jobless workers not applying for benefits. *Monthly Labor Review*, 123:21.

Appendix A   Abbreviations

- CARES: Coronavirus Aid, Relief, and Economic Security Act. The CARES Act, signed into law in March 2020, provided over $2 trillion of economic relief to workers, families, small businesses, industry sectors, and other levels of government hit hard by the public health crisis created by the Coronavirus Disease 2019 (COVID-19). Three important provisions created by the act were

  1. PUA: Pandemic Unemployment Assistance. The PUA created a federal unemployment insurance program for individuals not otherwise eligible for UI benefits, including the self-employed, independent contractors, gig economy workers, those seeking part-time employment, and individuals lacking sufficient work history.[13]
  2. FPUC: Federal Pandemic Unemployment Assistance. The FPUC provided $600 per week to those eligible for regular UI or Pandemic Unemployment Insurance (PUA).
  3. PEUC: Pandemic Emergency Unemployment Compensation. This extended unemployment benefits by an additional 13 weeks (up to 39 weeks for Indiana).

- LWA: The Lost Wages Assistance. The LWA program provided benefits of $300 per week after the expiration of FPUC to unemployed workers impacted by the COVID-19 pandemic.

- CAUWA: Continued Assistance for Unemployed Workers Act. The CAUWA legislation was designed to continue unemployment insurance benefits for those who were receiving relief from the CARES Act and continued many of the same or similar programs. It restarted FPUC @ $300 per week and extended PEUC by 11 more weeks.

  - MEUC: Mixed Earner Unemployment Compensation. The MEUC program introduced by CAUWA was designed to cover workers with both earned wages and self employment income, such as part-time musicians and performing arts professionals. They often qualified for regular UI but received disproportionately low benefits due to their previous wage history. The MEUC program provided these workers an additional federally funded $100 weekly benefit.

- ARPA: America Rescue Plan Act. ARPA, enacted in March 2021, extended PUA, expanded PEUC eligibility for up to 53 weeks, and continued the $300 FPUC through early September.

---

[13]The benefit amount was decided based on tax filing status. If the applicant filed as single tax filer, income from 2019 was to be used, If the individual did not file taxes or filed as married filing jointly, the individual will receive a minimum benefit amount. The minimum benefit amount varied for states and was $149 per week for Indiana. Those eligible for regular UI could also receive payments through PUC if they exhaue EB, or the state is not triggered on and the person in unemployed due to COVID-19.

Appendix B   Data

The UI data from Indiana Department Of Workforce Development (DWD) contains initial and continued claims and I cannot separate the two. I cannot identify workers working part-time. I also cannot identify Hispanics. The UI data from DWD are different from the initial weekly UI claims data released by the Department of Labor (DOL).[14] The DOL data contains all claims made in the week regardless of whether the claims were paid or denied. The DWD data contains only those claims that were paid.

In the Unemployment Insurance raw benefits file, a row represents recipients (Universal_ID) and columns the weeks. The values are the amounts received in respective weeks. The benefit amounts are rounded to the nearest $25. Weeks in which no benefits were paid to a recipient are marked as NA. Each id may have multiple rows indicating multiple spells (or benefit years) of unemployment. These are identified by variable "bnftstartdate". Some rows do not have any benefit amount. These are those who filed that initial claim but did not receive a payment, whether their claim is on hold or it is denied. The benefit amount for a particular week is the amount that was due for that week. If there are delays in the application review, the actual payment may have happened at a later late that included all due past payments. There are many IDs that do not receive any payments. Most of these claimants are duplicate UI initial claims filed in order to continue with an active PUA claim which they are required to file at the beginning of each quarter. (Only after this can they apply for PUC). I remove these observations that do not contain any non-zero payments as advised by the Indiana Department for Workforce Development (DWD). This removes some claims that were denied, as well as some of the PUC claims. Some of these denied claims could well be PUC claims as those eligible for regular UI were also eligible for PUC after they exhaust regular UI, PEUC, and EB.

The annual wage earnings are rounded to the nearest $50. These are earnings in the previous four quarters prior to the quarter first filed for UI. There are multiple wage values in case of multiple unemployment spells. I consider the wage associated with the earliest benefit year as the "base wage". Since a majority of benefit start dates are in 2020, this is typically wage in 2019. I drop wages less than $5000 and greater than $100,000 (4% of the observations).

Table B.1: Weekly wage and benefit amount

|	Men	Women	White	Blacks
Weekly wage ($)	917	582	787	531
Average UI amount ($)	590	532	576	478
N	270,993	251,009	400,906	70,096

The difference in weekly wage and benefit amounts by gender and race are shown in Table B.1. The

---

[14]https://oui.doleta.gov/unemploy/claims.asp

average annual wage and hence benefit amounts are smaller for women and Blacks as compared to men and whites respectively. Thus women earn 0.63 times the wage of men which is comparable to what was found in Institute for Women's Policy Research (2018).

Figure B.1 shows that the gender gaps in average weekly benefit amounts and unemployment duration are observed in all races.

Figure B.1: Average weekly benefit amounts and duration by race and gender
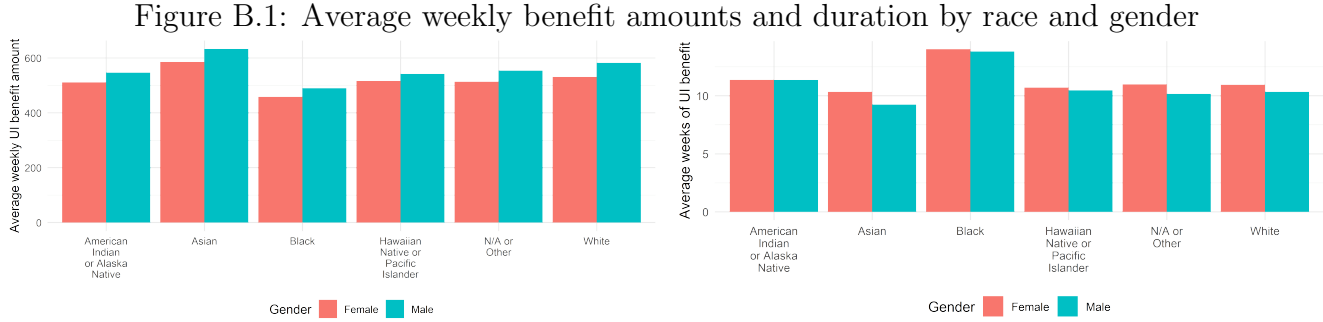
B.1 Breaks in unemployment

To study if there are "breaks" in the total unemployment duration, I count the instances when the individual enters unemployment. Table B.2 suggests that almost 65% of individuals have only one instance of unemployment, 87% have 2 or less instances of unemployment. Hence, the duration can be thought of as a continuous period without many breaks. For most of the analysis, I consider the first spell of job loss since this is most likely to be related to COVID disruption. Ganong et al. (2021) has more discussion on long-term unemployment during COVID-19.

Table B.2: Number of entries

Number of entry events	N	Cumulative sum	Cumulative proportion
1	330,313	330,313	0.65
2	102,847	433,160	0.85
3	34,726	467,886	0.92
4	13,557	481,443	0.95
>=5	26,814	508,257	1.00

B.2   How likely were workers to exhaust regular UI benefits?

I study the consequence of longer duration on probability of using the extra weeks of benefits provided by the CARES Act. The results are shown in Table B.3. In model 1, I do not control for any observables. Men were 10.4% likely to use the extra weeks of benefits. This probability is higher for women by 1.1 percentage points. In model 2, I control for observables. Adding observable fixed effects reduces the coefficient in magnitude but it remains positive and statistically significant. In model 3, I do not control for any observables. Whites were 10.1% likely to use the extra weeks of benefits. This probability is higher for Blacks by 6.1 percentage points. In model 4, I control for observables which reduces the coefficient in magnitude but it remains positive and statistically significant. Even after accounting for differences in observables women and Blacks were more likely than men and whites respectively to exhaust regular UI and use the extra weeks of benefits provided by the CARES Act.

Table B.3: Probability of exhausting the regular UI

	(1)	(2)	(3)	(4)
Women	0.070*	0.001		
	(0.028)	(0.001)		
Black			0.047***	0.033***
			(0.001)	(0.001)
ln(wage)				
Constant	12.260***		0.076***	
	(0.020)		(0.000)	
Observations	552,037	504,346	523,466	504,346
Control for observables		Yes	No	Yes
R-sq	0.00	0.03	0.00	0.03

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Observables include industry, occupation, wage, age, and location.

B.3 Distribution of weeks of unemployment

In Figure B.2, I show the distribution of total weeks of unemployment for the population in 2020. Since the data only contains payments made under regular UI, the duration is best thought as duration under regular UI. A bump is observed around 26 weeks, which is the maximum weeks of UI benefits allowed by the state of Indiana. Those receiving more than 26 weeks are claimants who may have received partial benefits in a given week, which would extend the number of weeks for receiving benefits.

The duration is an underestimate of true unemployment duration because the data does not contain any benefits paid through PEUC extension of 13 weeks. So, the weeks for recipients who continued receiving benefits through PEUC are not counted. However, this bias is likely to be small as the PEUC extension went into affect only after regular UI was exhausted which does not happen for 91% of the sample. About 11% (57,753) of recipients, received benefits for 25 or 26 weeks and potentially received benefits for more weeks through PEUC. The claim that not many used the PEUC, also indicates that it is reasonable to assume a non-receipt of UI as return to employment.

Figure B.2: UI duration histogram
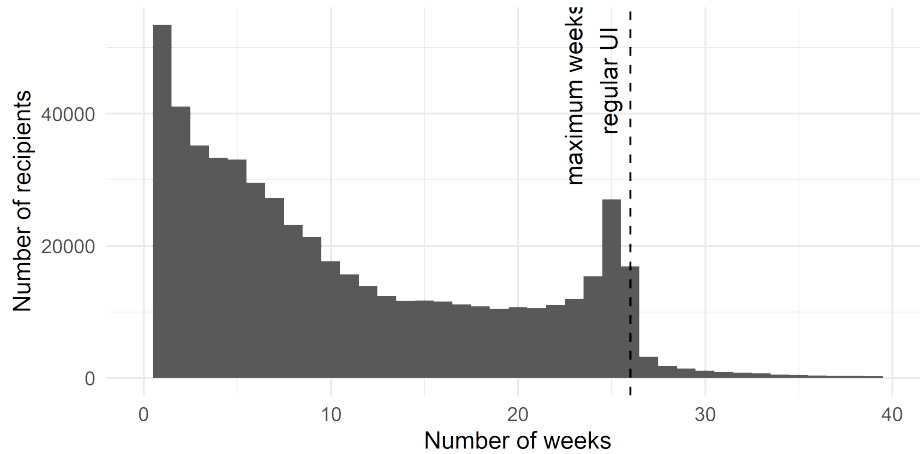
B.4 Start and end date densities

In Figure B.3, I compare the start and end dates of UI receipts by gender and race. For women, the start dates are similar to men, but the end dates are later than men. Thus, both get unemployed around the same time but the longer duration of unemployment for women is due to women returning to work later. Comparing Blacks and whites, it also seems to be the case that the start dates are similar to white, but the end dates are later.

Figure B.3: Distribution of start and end dates of UI receipt

B.5 Time variation in incidence

The time variation in incidence (proportion of recipients over labor force) is shown in Figure B.4. For women and Blacks, a larger share of labor force received benefit in each month in 2020. However, the gap bigger for Blacks.

Figure B.4: Incidence (UI recipients by Labor force (2019)) by time
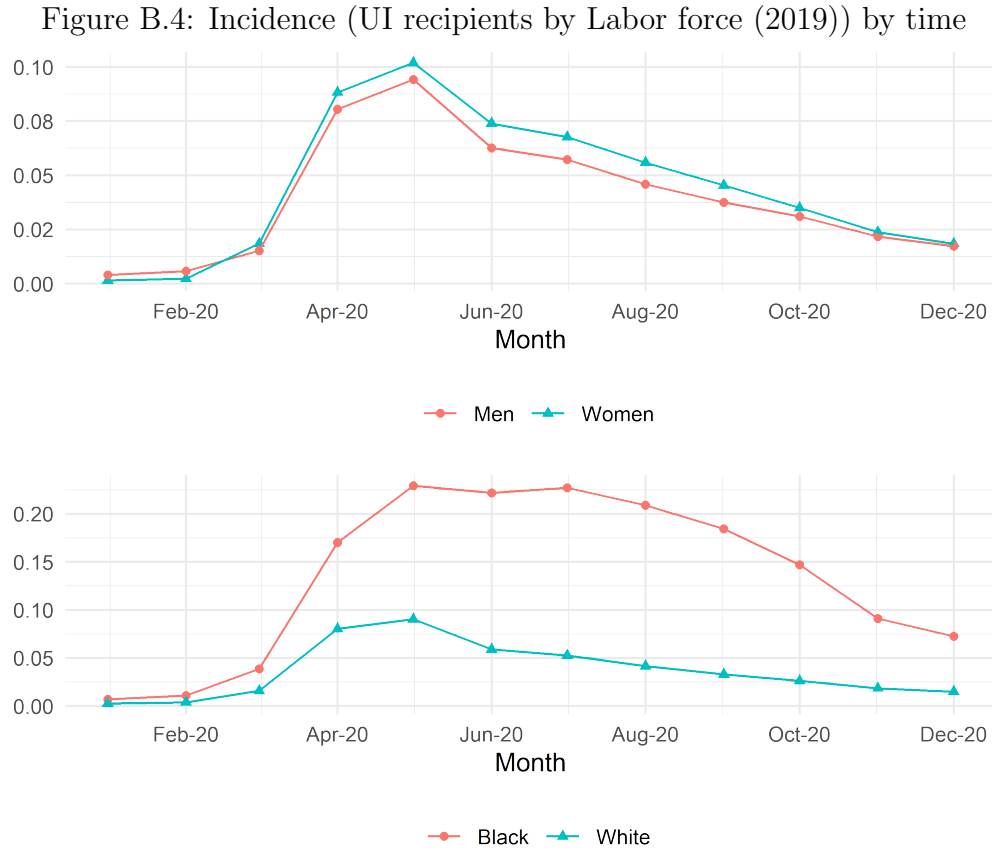

B.6 UI Claimant vs population shares

To understand how the proportion of claimants compare to the employment shares, Figure B.5 compares population and claimant shares by occupation, industry, age groups and regions. On the X-axis, I plot the group's proportion in the population and on the Y-axis, I plot the proportion of the group observed in the claimant data. A 45-degree line is also shown for reference. If a group is above the line, it means that the group has a larger share of claims than their population or a higher incidence of UI recipiency. Likewise if a group is below the 45-degree line, the group has a lower incidence of UI recipiency. The size of the circle indicates the average weeks of UI receipt. Many industries and occupations had a disproportionate share of UI recipiency as compared to their population share as can be seen from the top two figures. This is consistent with the claim that some industries and occupations were hit harder during the COVID-19 pandemic than others. Comparatively, the shares by age groups and regions are quite comparable to their population shares suggesting that the all age groups and regions were similarly affected.

Figure B.5: Claimant vs population shares
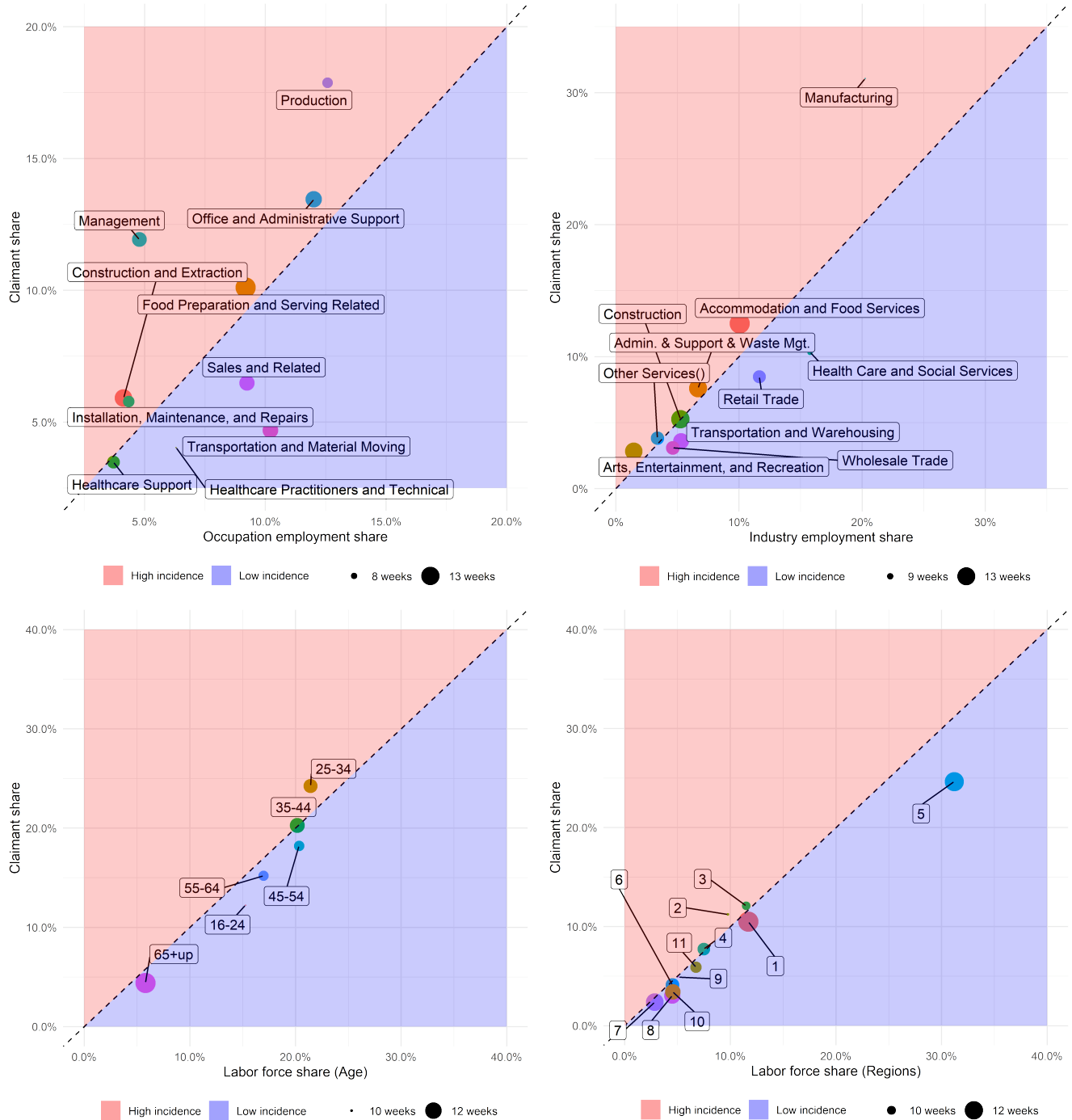
B.7   Effect of the extra $600 and extra $300

Figure B.6 shows the effect of the extra $600 and extra $300. With regular UI, the benefits are always below the weekly earnings for any level of earnings. With the extra $600, the UI benefits are higher than the earnings for weekly earnings <$990 (equivalent to $24.75 per hour or $51,480 annual wage) which is true for around 78% of UI claimants.[15] With the extra $300, the UI benefits are higher than the earnings for weekly earnings <$560 (equivalent to $14 per hour or $29,120 annual wage) which is true for around 45% of UI claimants.

Figure B.6: UI benefit vs weekly earnings
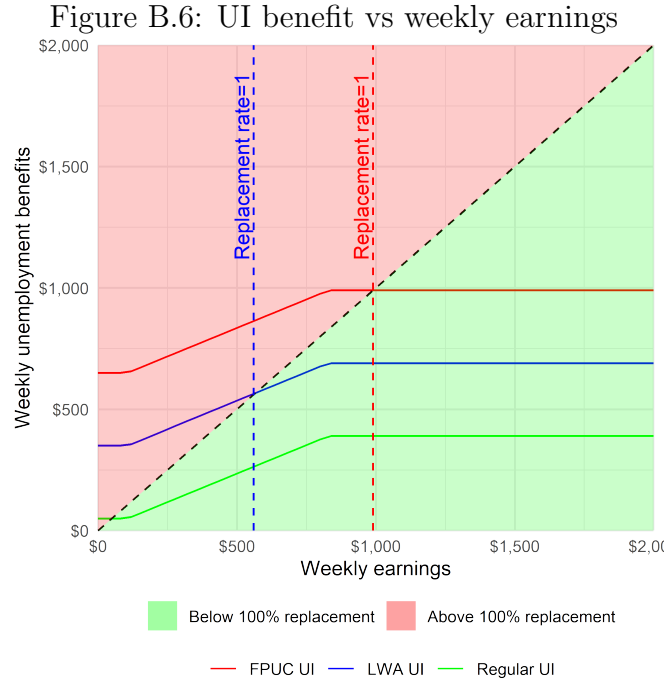

B.8   Recipients by time

Figure B.7 shows the total recipients broken down into amount received. There is a steep increase in the number of recipients in the weeks of April following the introduction of Indiana's Stay-at-Home order and passage of the CARES Act. There is a lag of two weeks after the extra $600 benefits was signed in law (March 27, 2020) and when the payments started (April 18, 2020). The increase continues until mid-May and then starts to decline. The UI benefit amount increases in the months of April until July due to the extra $600 FPUC benefit. The payments <$600 are likely because of deductions made for garnishments (due to child support, taxes, etc.) or recovery of past overpayments. Not more than 50% of FPUC payments could be deducted for such purposes (U.S. Department of Labor).

Figure ?? shows the distribution of start and end dates of unemployment spells for LWA eligible and ineligible groups. Since I argue that the groups are similar, I expect the distributions to look

---

[15]This is comparable to the number in Ganong et al. (2020) who find that at the national-level 76% of unemployed workers have a statutory replacement rate above 100%.

Figure B.7: Number of recipients
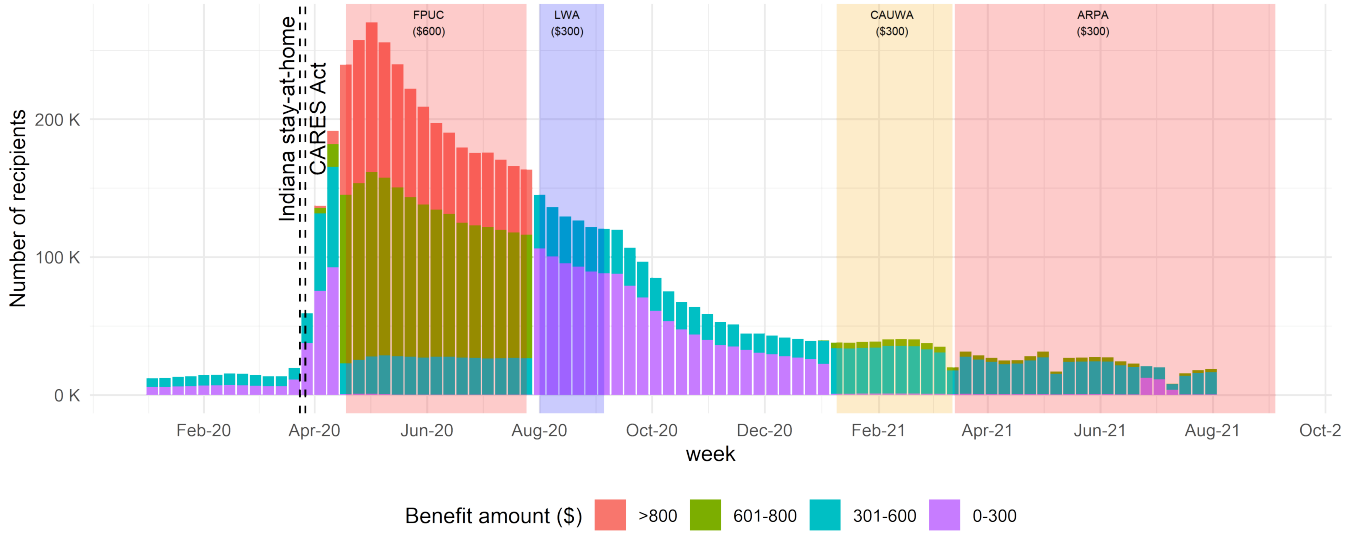
similar until FPUC expiration and after LWA expiration and different during LWA benefits. The eligible group has earlier start dates and later exit dates as compared to ineligible group. The later end dates can be because of delay in return to work. However, it is not very clear why they have earlier start dates. The ineligible group has earlier end dates during the LWA period which is expected. This also highlights the importance of controlling for benefit exhaustion.

B.9   How to deal with "Other" respondents for ethnicity question

Around 55,000 ($\approx$ 10%) of total UI recipients have responded to the ethnicity question as "N/A or others". There are two options available regarding how to deal with them: drop them and only focus on those who have responded hispanic and non-hispanic, or add them to non-hispanic assuming that hispanics are unlikely to select this option. These NA responders have smaller weeks than non-hispanic responders. I discuss the implications for each of these options.

The most obvious option is to drop the NA respondents. This is a sizable proportion and hence one must be careful about dealing with these. While studying job loss severity, we calculate the average weeks and incidence (respondents/ labor force) where the labor force is available as Hispanics and non-hispanics. Dropping the NA respondents would reduce the non-hispanic respondents, reducing the non-hispanic incidence and increasing the duration since NA respondents have lower duration. This would decrease the incidence and increase the duration gap compared to hispanics. Adding these to non-hispanics would increase the respondents and non-hispanic incidence and decrease the non-hispanic duration. This would increase the incidence gap and decrease the duration gap. One principle would be to select an option that biases the estimates in opposite direction, which are the incidence and duration gap. However, as we have seen, both gaps move in opposite direction in each option. Hence, it makes sense to include both numbers and argue that numbers don't change much irrespective.

Appendix C   Important dates

- 2020
  - Mar 6 - Public health emergency declared in Indiana
  - Mar 19 - Public schools closed in Indiana
  - Mar 23 - Indiana issues stay-at-home (SAH) orders
  - Mar 26 - CARES Act signed into law
  - May 1 - Indiana starts to re-open
  - Aug 08 - Up to $44 billion made available from Federal Emergency Management Agency's (FEMA) Disaster Relief Fund to provide financial assistance to Americans who have lost wages due to the COVID-19 pandemic.
  - Aug 22: Indiana approved for a FEMA grant under the Lost Wages Assistance program.
  - Sept 10 - Indiana declares to start disbursing $300 LWA payments beginning Sept. 21
  - Sept 21 - Indiana starts disbursing $300 LWA payments retrospectively
  - Sept - Final opening stage for Indiana businesses
- 2021
  - May 17 - Indiana announced that the extended unemployment would end by June 19.
  - Jul 13 - Indiana was advised to continue benefits while the court considered the lawsuit against the state. The benefits continued until September 2021.

Appendix D Women and Black recipients by industry and occupation

In Table D.1, I study the distribution of women and Blacks in top 10 industries that generated the most claims. Out of all the claims from manufacturing industry workers, 34% are women and 12% are Blacks. Since women are roughly 47% of the labor force, this suggests that women are less likely to be employed in manufacturing. Out of all the claims from Health Care and Social Services Industry, 89% are women, suggesting that women are more likely to be employed in this industry. Analogous data for occupation is shown in Table D.2. Blacks constitute 10% of the population of Indiana. Thus, they seem to be more likely to be employed in Admin support and health care and Social Services industries, and in Healthcare Support Occupations.

Table D.1: Industry Employment by gender and race

NAICS 2-digit code	N	Women proportion	Black proportion	Age 50+ proportion
Manufacturing	1,366,217	0.34	0.12	0.33
Accommodation and Food Services	892,874	0.65	0.16	0.21
Admin. Support Waste Mgt. Rem. Services	508,955	0.50	0.30	0.26
Retail Trade	468,207	0.59	0.16	0.31
Health Care and Social Services	453,855	0.89	0.22	0.28
Construction	397,612	0.10	0.06	0.31
Transportation and Warehousing	221,877	0.37	0.26	0.37
Other Services(Except Public Administration)	210,443	0.62	0.12	0.30
Arts, Entertainment, and Recreation	181,900	0.55	0.17	0.32
Wholesale Trade	174,589	0.35	0.15	0.38

Table D.2: Occupation Employment by gender and race

Occupation	N	Women proportion	Black proportion	Age 50+ proportion
Production	839,150	0.35	0.13	0.31
Office and Administrative Support	811,123	0.68	0.24	0.31
Food Preparation and Serving Related	720,827	0.65	0.14	0.20
Management	643,088	0.51	0.15	0.33
Construction and Extraction	411,266	0.06	0.09	0.28
Sales and Related	366,657	0.64	0.15	0.32
Installation, Maintenance, and Repair Occs	282,112	0.12	0.10	0.31
Transportation and Material Moving	277,344	0.21	0.23	0.40
Healthcare Support	166,831	0.94	0.27	0.17
Personal Care and Service	156,568	0.78	0.16	0.22

Appendix E   Characterizing the job losers

E.1   Industry

Table E.1 shows the average weeks of UI receipt by industry. There is a lot of variation in weeks of unemployment by occupation. Noticeably, manufacturing industry that represents almost one-third of claimants has the one of the smallest duration of unemployment.[16]

Table E.1: Top and bottom 5 industries by weeks of UI receipt

NAICS 2-digit code	weeks	NAICS 2-digit code	weeks
Accommodation and Food Services	14.13	Public Administration	10.51
Construction	13.16	Management of Companies and Enterprises	9.64
Information	12.96	Health Care and Social Services	8.81
Admin. & Support & Waste Mgt. & Rem. Services	12.95	Manufacturing	8.55
Real Estate and Rental and Leasing	12.76	Utilities	6.26

E.2   Occupation

Table E.2 shows the average weeks of UI receipt by occupation. There is a lot of variation in weeks of unemployment by occupation. Noticeably, production occupations, that represent 18% of claimants, has the one of the smallest duration of unemployment. Someone in Healthcare occupations is unemployed for an average of 7.48 weeks, that is roughly half of someone in Food preparation and Serving Related occupation (14.06).

Table E.2: Top and bottom 5 occupations by weeks of UI receipt

Occupation	weeks	Occupation	weeks
Food Preparation and Serving Related	14.03	Installation, Maintenance, and Repairs	9.36
Building and Grounds Cleaning and Maintenance	12.82	Production	9.04
Legal	12.78	Military Specific	8.85
Construction and Extraction	12.27	Architecture and Engineering	8.79
Arts, Design, Entertainment, Sports, and Media	11.81	Healthcare Practitioners and Technical	7.48

The results for job loss severity by industry and occupation are shown in Table E.3 and Table E.4. Manufacturing industry represents one-third of the claims had a higher incidence (Recipients/ Employment) but lower duration of unemployment. Thus, a higher share of manufacturing seems to have helped the region in recovering relatively quickly. Workers employed in accommodation and food service industry, working in Office and Administrative Support as well as Food Preparation and Serving Related occupations are among the most severely affected. They more likely than average to receive UI benefit (18%), weeks of unemployment (11) and suffer a layoff (28%).

---

[16]Cortes and Forsythe (2020) shows that the COVID-19 induced employment losses have been substantially larger in lower-paying occupations and industries.

Table E.3: Job loss severity - Industries

Industry	UI recipients	Employment (Feb 2020)	Recipients/Employment	weeks	Layoff
Manufacturing	157,150	535,856	0.29	8.7	0.18
Accommodation and Food Services	63,040	266,008	0.24	14.2	0.33
Health Care and Social Services	50,414	417,385	0.12	9.1	0.24
Retail Trade	42,654	308,265	0.14	10.7	0.30
Admin. & Support & Waste Mgt.	38,221	176,657	0.22	13.1	0.51
Construction	28,533	138,683	0.21	13.9	0.35
Other Services	19,257	89,315	0.22	10.9	0.23
Transportation and Warehousing	18,402	140,061	0.13	12.0	0.33
Wholesale Trade	15,144	122,149	0.12	11.2	0.30
Arts, Entertainment, and Recreation	14,275	38,490	0.37	12.7	0.18

Table E.4: Job loss severity - Occupations

Occupation	UI recipients	Employment (2019)	Recipients/Employment	weeks	Layoff
Production	91,351	386,740	0.24	9.1	0.21
Office and Administrative Support	67,783	369,170	0.18	11.7	0.34
Management	58,010	147,080	0.39	11.2	0.30
Food Preparation and Serving Related	50,915	282,350	0.18	14.1	0.33
Sales and Related	32,398	284,150	0.11	11.1	0.32
Construction and Extraction	31,543	127,000	0.25	12.9	0.32
Installation, Maintenance, and Repairs	29,446	133,440	0.22	9.5	0.24
Transportation and Material Moving	24,104	313,990	0.08	11.5	0.29
Healthcare Practitioners and Technical	18,696	193,730	0.10	8.0	0.21
Healthcare Support	17,543	114,240	0.15	9.9	0.31

E.3 Age

The results for job loss severity by age groups are shown in Table E.6. The age group 25-34 is among the most severely affected with higher than average values of UI receipt, weeks of unemployment and likelihood of a layoff. The high duration for 65 and above age group is consistent with health risk of COVID-19 being more for this age group. This group also has the lowest likelihood of returning to labor force(64%) as compared to other groups (Appendix E.6).

Table E.5: Job loss severity - Age

Age	UI recipients	Labor force (2019)	Recipients/Labor force	weeks	Layoff
16-24	66,293	518,408	0.13	10.0	0.42
25-34	131,348	727,481	0.18	11.4	0.34
35-44	109,772	684,873	0.16	11.6	0.28
45-54	98,648	690,432	0.14	10.7	0.23
55-64	82,317	576,533	0.14	10.7	0.18
65+up	23,858	196,776	0.12	13.0	0.14

E.4 Wage

Job loss duration by wage quartiles are shown in Table E.6.[17] The high wage workers received benefits for the shortest duration and highest likelihood of a permanent job loss. The duration of receipt increases for low wage. The fact that low wage workers are least likely to return to the same employer is consistent with changed preference of workers.

Table E.6: Duration - Wage

Wage quartile	Recipients	weeks	Layoff
1 (lowest wage)	125,823	13.0	0.44
2	124,889	12.1	0.33
3	125,029	10.3	0.23
4 (highest wage)	125,358	8.7	0.17

E.5 Region

The results for job loss severity by regions are shown in Table E.7. Region 5 included the capital city Indianapolis and labor force are higher as compared to other regions. This region has a relatively high weeks of unemployment and likelihood of permanent job loss but the recipients/ labor force is among the lowest. While there is some variation by geographical regions, no region does worse on recipiency, duration and layoffs.

Table E.7: Job loss severity - Regions

| EGR	UI recipients	Labor force (2019)	Recipients/Labor force	weeks	Permanent loss
1	51,686	384,117	0.13	12.4	0.27
2	57,229	320,840	0.18	9.4	0.29
3	61,040	377,127	0.16	9.9	0.25
4	38,353	245,638	0.16	10.5	0.24
5	124,664	1,022,682	0.12	12.3	0.37
6	21,050	148,322	0.14	10.7	0.28
7	11,959	93,351	0.13	11.6	0.30
8	15,378	147,860	0.10	11.4	0.29
9	25,335	167,110	0.15	9.4	0.20
10	17,566	149,218	0.12	11.1	0.27
11	30,202	221,611	0.14	10.3	0.26

---

[17]The nominal thresholds for annual wages are $18,100 (25th percentile), 31,500 (50th percentile), 48,600 (75th percentile), and 149,950 (100th percentile)

E.6   Worker transitions to same and different employer

One issue regarding COVID-19 related layoffs that many of them were temporary and employees were recalled by employers as the demand rose. This would increase the rate of return to same employer after an unemployment spell. At the same time, employers were facing difficulties in finding workers in early 2021. This increased competition for labor increases the offered wages which may have caused employees to switch employer. This would decrease the rate of return to the same employer. In order to study which effect dominates, I focus on employer-employee pairs observed in the first quarter and observe employee transitions in later quarters.[18] Figure E.1 shows this proportion for the year 2019 and 2020.

The total workers in the sample are 613,322. These are workers that received UI in at least one week starting 2020 through Q23 of 2022. In Q1 of 2020, 571,907 are working with some employer. In Q2, 86%, 4%, and 10% are working with the same employer, different employer and not working. By Q4, these numbers change to 66%, 18% and 16% respectively. Thus, within a year 16% of workers have left employment (and potentially labor force), 18% of workers have switched to a different employer and 66% have remained with the same employer. In 2019, the proportion staying with the same employer is higher (78%), those switching to a different employer is comparable (18%) and those leaving employment is lower (2%). Thus, compared to 2019, in 2020, workers are less likely to work for the same employer, but this is not driven by higher switching of employees but by workers leaving employment.

The sample, comprising of job losers in the pandemic, is likely not representative of the entire workforce. The job losers have likely higher rates of leaving employment and switching to different employer.

Figure E.1: Worker transitions

---
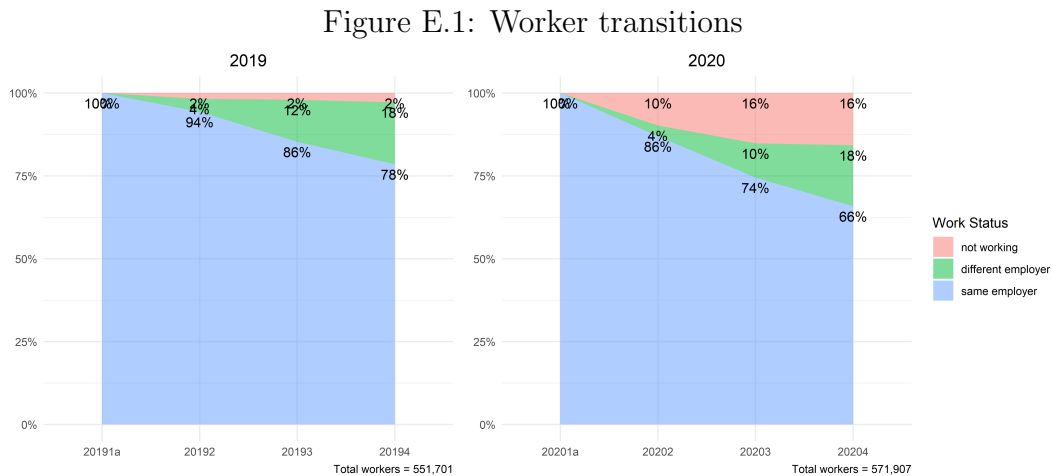
[18]I do this exercise at quarter level since the employer-employee-wage information is available only at this level.

Appendix F   Recipiency rate

I provide additional evidence that the propensity to apply for UI increased during the months of FPUC and LWA. I study how the number of UI recipients relate to the number of unemployed workers and how the relationship changes during the COVID-19 pandemic. The number of UI recipients is expected to be smaller than the number of unemployed workers. This is because many unemployed workers do not receive benefits because they either think or are ineligible for benefits (for example self-employed and gig economy workers), or they do not need the money, or have a negative attitude about UI, or have problems with the application process (U.S. Bureau of Labor Statistics, 2020a; Gould-Werth and Shaefer, 2012; Wandner and Stettner, 2000). Forsythe (2021) shows that during the COVID-19 pandemic, 40% of unemployed did not receive benefits because they thought they are ineligible to apply. Additionally, the sudden increase in UI applicants during COVID-19 pandemic strained the state UI systems and may have resulted in some eligible individuals not receiving benefits (Huang, 2020; Landergan, 2021). This is also suggested by the observation that job losses during COVID-19 pandemic were much higher than the implied by new unemployment claims (Coibion et al., 2020).

Table F.1: UI recipients and the number of unemployed

Month	Unemployed	UI recipients	Recipients/Unemployed
January 2020	119,356	19,023	0.16
February 2020	114,552	22,051	0.19
March 2020	123,603	65,664	0.53
April 2020	528,808	304,881	0.58
May 2020	388,902	349,978	0.90
June 2020	340,905	240,431	0.71
July 2020	298,074	218,104	0.73
August 2020	238,890	176,433	0.74
September 2020	200,335	143,141	0.71
October 2020	171,600	114,030	0.66
November 2020	161,074	78,957	0.49
December 2020	146,233	62,624	0.43
January 2021	156,607	63,788	0.41
February 2021	155,827	54,580	0.35
March 2021	153,244	44,138	0.29
April 2021	140,724	40,127	0.29
May 2021	152,072	42,976	0.28
June 2021	159,703	31,871	0.20
July 2021	142,656	28,397	0.20

[*] The data on number of unemployed comes from the Local Area Unemployment Statistics (LAUS) program of the U.S. Bureau of Labor Statistics.

In Table F.1, I compare the number of UI recipients to the number of unemployed.[19] As expected,

---

[19]The number of unemployed is the U-3 measure, which is smaller than the U-6 measure that includes marginally attached and underemployed workers. This can also contribute to the large increase in the recipiency rate during the pandemic. Another reason for the high ratio might be an overcounting of unemployed by UI recipients if many workers are working at reduced hours, they will counted as receiving UI but would not be counted as unemployed in

the number of UI recipients is lower than the number of unemployed. But the relationship changes during the COVID-19 pandemic as seen from the ratio of number of recipients to the number of unemployed, also known as recipiency rate (Wandner and Stettner, 2000). The recipiency rate is less than 0.2 in the months of January and February 2020, rises to 0.9 in May 2020 and declines after.[20] The recipiency rate is >70% during the months of FPUC and LWA (April 2020 - September 2020). Thus, the UI recipiency rate increased during the pandemic and is especially high during the months of enhanced UI payments during 2020.

Note that the increase in recipiency rate is not because of expansion of UI to include the self-employed and contract workers (including gig-economy workers) through the CARES Act. These newly eligible workers are not contained in our data and hence not included in the count of recipients. Adding them will increase the recipiency rate even more. Thus, the increase is because of a larger share of unemployed workers who are already eligible for regular UI applying for benefits. It is possible that increased benefit amounts, the uncertainty about being able to back to work, and health concerns while at work, made eligible employees more likely to apply.[21]

BLS data.

[20]The recipiency rate for January and February are comparable to 0.18, the Indiana average recipiency rate in 2019.

[21]Another reason for the increase could be an undercounting of the number of unemployed in the Current Population Survey (CPS), which is one of the inputs the BLS uses to calculate the number of unemployed at the state level. In the early months of the pandemic, the CPS data likely classified many unemployed as "employed but absent from work" leading to an under-counting of the unemployed (U.S. Bureau of Labor Statistics, 2020c). However, the magnitude of the misclassification was small (6% of the total unemployed) and started decreasing since months before July 2020 (U.S. Bureau of Labor Statistics, 2020b). The other input in calculating unemployment is UI claims which would bias the recipiency rate upwards (California Policy Lab, 2022).