The Impact of the COVID-19 Recession on the US Labor Market: Occupation, Family and Gender*

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Abstract

The economic crisis associated with the emergence of the novel corona virus is unlike standard recessions. Demand for workers in high contact and inflexible service occupations has declined, while parental supply of labor has been reduced by lack of access to reliable child care and in-person schooling. This has led to a substantial and persistent drop in employment and labor force participation for women, who are typically less affected by recessions than men. This essay examines real time data on employment and gross job flows to document the impact of the pandemic by occupation, gender and family status. The potential long-term implications of this crisis are also discussed, including the role of automation in depressing the recovery of employment for the worst hit service occupations.

Recessions in the United States are usually associated with a larger employment drop for men than for women. But during the COVID-19 recession, employment losses were larger for women (Albanesi and Kim (2021)).

There are demand-side and supply-side reasons why the pattern of employment changes during recessions is different for men and women, and these patterns are not the same during the pandemic as in previous recessions. On the demand side, the asymmetry is partly explained by gender differences in the occupation distribution, with men primarily employed in production occupations and women concentrated in service occupations, which tend to be less cyclical (Albanesi and Şahin (2018)). During the pandemic, however, there has been a sizable drop in the demand for services, as a result of both the mitigation measures enacted to contain the pandemic and consumers' response to the risk of infection (Chetty et al. (2020)). Given the concentration of women in service occupations, they have been disproportionately hit by the corresponding employment losses.

On the supply-side, married women tend to increase their attachment to the labor force during economic downturns relative to expansions, as a form of household insurance that reduces the impact of recessions (Ellieroth (2019)). Before the pandemic, the lower cyclicality of women's employment led to a reduction in the cyclical volatility of aggregate employment as the share of

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women in the workforce increased from the 1970s onward (Albanesi (2019)). During the pandemic, limited availability of in-person childcare and schooling options have led many parents – and women in particular – to exit the labor force.

This essay documents the degree to which the pandemic recession has hit women and mothers in particular, uncovers the main forces that have led to this outcome, and discusses potential policy responses to mitigate the impact of these developments going forward. We start by comparing the change in employment by gender and family status during the pandemic to the Great Recession and the pandemic recession to illustrate the unique nature of the current downturn. We then turn to the role of occupational differences. To do so, we classify occupations by their exposure to the pandemic, based on contact intensity and ability to work remotely, and show that women are overrepresented in high-contact and inflexible occupations most affected by the pandemic.

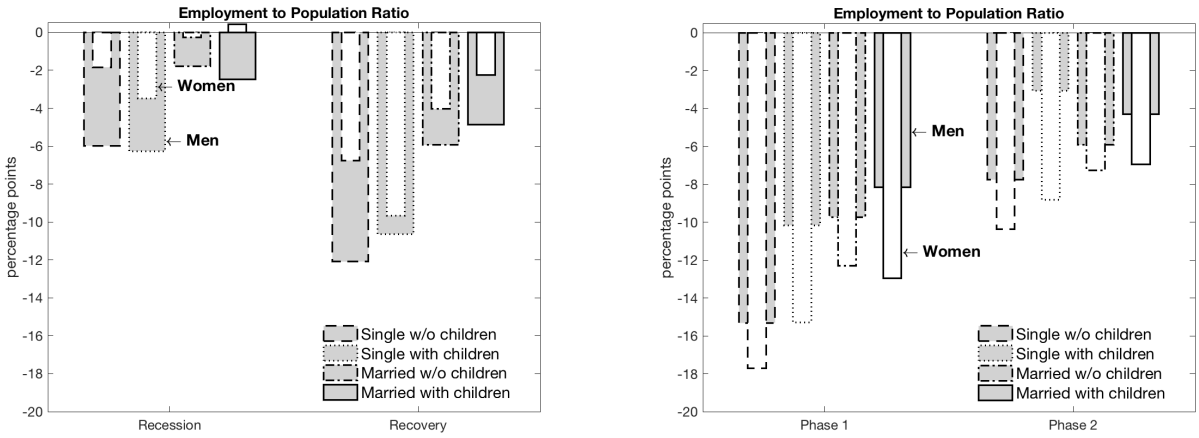
We then explore the importance of the supply-side and demand-side responses by looking at gross flows of labor. For example, the flow from employment to non-participation can be viewed as a supply-side withdrawal from the labor market, while the flow from employment to unemployment can be viewed as driven from the demand-side of the labor market. We find that employment to non-participation flows more than double during the pandemic, and also show sizable gender gaps pointing to a greater rise for women with children. We also discuss the role of gender differences in pre-pandemic earnings in accounting for the women?s greater loss in employment.

We conclude by discussing some of possible continuing impacts of the pandemic on the labor market. In particular, we focus on what the elements of family status, occupation and gender might foretell about whether the US economy is likely to experience another "jobless recovery," and how the newly established patterns of remote work may affect gender wage gaps looking forward.

Comparing the Pandemic Recession to the Great Recession

To illustrate how the employment losses of men and women during the pandemic recession differed from earlier recessions, we compare the pandemic recession to the Great Recession, which had a typical pattern. Figure 1 shows the change in the employment-to-population ratio by gender and family status during the pandemic recession in 2020 and the Great Recession relative to before each recession. For the Great Recession, the pre-recession phase corresponds to the period between March 2007 and November 2007, the Recession phase is from December 2007 to June 2009 (which corresponds to the dates determines by the Business Cycle Dating Committee of the National Bureau of Economic Research). The Recovery Phase is from July 2009 to July 2012. For the pandemic recession, the change is relative to February 2020, and we consider two time periods, Phase 1, comprising March, April and May 2020, when the pandemic started and the strictest mitigation measures were in place, and Phase 2, from June to November 2020, with less stringent mitigation measures.

During the Great Recession (and in previous recessions before that), the decline in women's



(a) Great Recession

(b) Pandemic Recession

Figure 1: Change in the employment to population ratio relative to pre-recession during the Great Recession and the pandemic recession by gender and family status. For the Great Recession, pre-recession corresponds to March-November 2007, Recession to December 2007 to June 2009, and Recovery to July 2009 to July 2012. For the pandemic recession, pre-recession corresponds to February 2020, Phase 1 to March-May 2020 and Phase 2 to June-November 2020. Source: Author's calculations from CPS.

employment is sizably smaller than men's for every demographic group. while during the pandemic recession, the decline in employment is larger for women than for men in every demographic group in both phases. In Phase 1, single men's without children employment declines by approximately 15 percentage points, whereas the decline is 18 percentage points for comparable women. For single men with children, the decline is 10 percentage points, while it is 15.5 percentage points for single women with children. For married men without children, the decline is 10 percentage points, but it is equal to 12.5 percentage points for married women without children. Finally, for married men with children, the decline is 8.5 percentage points, while for comparable women the employment to population ratio declined by 13 percentage points. In Phase 2, employment continues to be well below pre-pandemic levels. For men, employment ranges between 8 and 3 percentage points below pre-pandemic levels depending on family status, and for women between 11 and 8 percentage points lower, with the largest gender gaps are among workers with children. Among single workers with children, the employment decline for women relative to pre-pandemic is more than twice as large as for men, while for married workers with children it is approximately 50 percent larger.

Both labor demand and supply factors likely contributed to women's larger employment losses during the pandemic. Women are more likely to be employed in service-providing industries and service occupations. While these tend to be less cyclical compared to goods producing industries and production occupations that employ a larger share of men (Albanesi and Şahin (2018)), during

the COVID-19, infection risk was most severe in the service sector, leading to a large reduction in demand for services. The occupation and industry distribution by gender does not vary by marital status (Cortes and Pan (2018)), and thus can help explain why employment declined more for women than for men.

Another unique factor associated with the pandemic recession was the increased childcare needs associated with the disruptions to school activities, which may have contributed to a reduction in labor supply of parents. Why was it mothers in particular who responded to the lack of predictable in-person schooling activities in households where fathers were also present? Gender norms likely played a role. But from the perspective of an economic model of the family, this response should also be driven by differences in the opportunity cost as measured by wages. In the United States and other advanced economies, there is a substantial "child penalty" that reduces wages for women when, and even before, they become mothers and throughout the course of their lifetime. The penalty is driven by a combination of occupational choices, labor supply on the extensive and intensive margin, that begin well before women have children. Cortes and Pan (2020) estimate that the long run child penalty– three years or more after having the first child– for US mothers is 39 percent and they also find that child related penalties account for two-third of the overall gender wage gap in the last decade. Given the child penalty, most working mothers at the start of the pandemic were likely to be earning less than their partners, and for those couples the optimal response to the increased child supervision needs was for mothers to reduce labor supply. In addition, Cajner et al. (2020) show that employment losses were concentrated disproportionately among lower wage workers at the beginning of the pandemic and Chetty et al. (2020) find that by the fall of 2020, lower wage workers' employment was still more than 20 percent below pre-pandemic values, with a much larger recovery for higher wage workers. Given that the child penalty tends to relegate women to jobs and occupations at the lower end of the wage distribution, it may have also played a role in their disproportionate loss of employment. The next section consider gender differences in occupations during the pandemic recession.

Role of Occupations

To explore the role of the occupation distribution, we classify occupations along two dimensions based on their flexibility and contact intensity. The distinction between flexible and inflexible occupations is made according to whether the occupation can be carried out remotely. Flexible occupations include occupations that allow their employees to work remotely, whereas inflexible occupations involve outdoor activities or require operating on site equipment. The distinction between high-contact and low-contact occupations is based on workers' physical proximity to customers or co-workers while on the job. We then document the distribution by gender across these occupations (Albanesi and Kim (2021)).

Table 1 displays where various occupations fall in the categorization and Table 2 reports the

distribution of workers by gender across occupations for four categories defined in Table 1. The inflexible/high-contact occupations are the most vulnerable to the COVID-19 shock and are dominated by female workers. Twenty-six percent of female workers are employed in occupations that are inflexible/high-contact, while only 6 percent of men work in these occupations. Flexible/high-contact occupations also exhibit a high female share at 76 percent. Male workers are disproportionately represented in inflexible/low-contact occupations, with 40 percent of male workers but only 11 percent of female workers employed in these occupations, with a female share of employment of only 19 percent in this category. Flexible/low-contact occupations are the largest category, accounting for 51 percent of overall employment, specifically 53% of female employment and 48 percent of male employment, with a female share of 50 percent.

Table 1: Occupation Classification

	Flexible	Inflexible
High-contact	Education, Training, and Library	Healthcare Practitioners and Technical
		Healthcare Support
		Food Preparation and Serving
		Personal Care and Service
Low-contact	Management	Protective Service
	Business	Building and Grounds Cleaning and Maintenance
	Computer and Mathematical	Farming, Fishing, and Forestry
	Architecture and Engineering	Construction Trades, Extraction
	Life, Physical, and Social Science	Installation, Maintenance, and Repair
	Community and Social Services	Production
	Legal	Transportation and Material Moving
	Arts, Design, Entertainment, Sports, and Media	
	Sales and Related	
	Office and Administrative	

Author's calculations based on O*NET. Occupations are inflexible if their inflexibility score is above the median and flexible otherwise. Occupations are high-contact if the contact intensity score corresponds to a distance of less than 6 feet. Flexibility scores and contact intensity scores are reported in Table **??** in the Online Appendix.

Table 2: Occupational Distribution by Gender

Group	Employed women	Employed men	Total employed	Female share
Flexible, High-contact	10	3	6	76
Flexible, Low-contact	53	48	51	50
Inflexible, High-contact	26	9	17	73
Inflexible, Low-contact	11	40	26	19

All values in percentage. Source: Author's calculations based on February 2020 CPS.

We calculated the variation in employment to population ratio for these four sets of occupations starting in February 2020 and comparing each month in 2020 to the corresponding month in the previous year, to account for seasonality in employment variation by occupation. Figure 2 displays the results in the aggregate and by gender for each occupation. Inflexible/high-contact occupations show the largest decline in employment, reaching a trough of -38 percent in April, and only recovering to -12 percent by September, with further declines by the end of the year.

Inflexible/low-contact occupations are the second worst hit, with a decline in employment of close to 30 in April, though employment for these occupations is only 5 percent lower than one year prior by the fall. Employment in flexible/high-contact occupations dropped to a low of -17 percent relative to one year prior in April but recovered rapidly, and has remained 2-8 percent lower than one year prior in the summer and fall. Finally, flexible/low-contact occupations, which account for the biggest share of employment, were the least impacted, with a drop in employment of -9 percent relative to one year prior in April, and a recovery to 2-4 percent lower relative to one year prior from June onward.

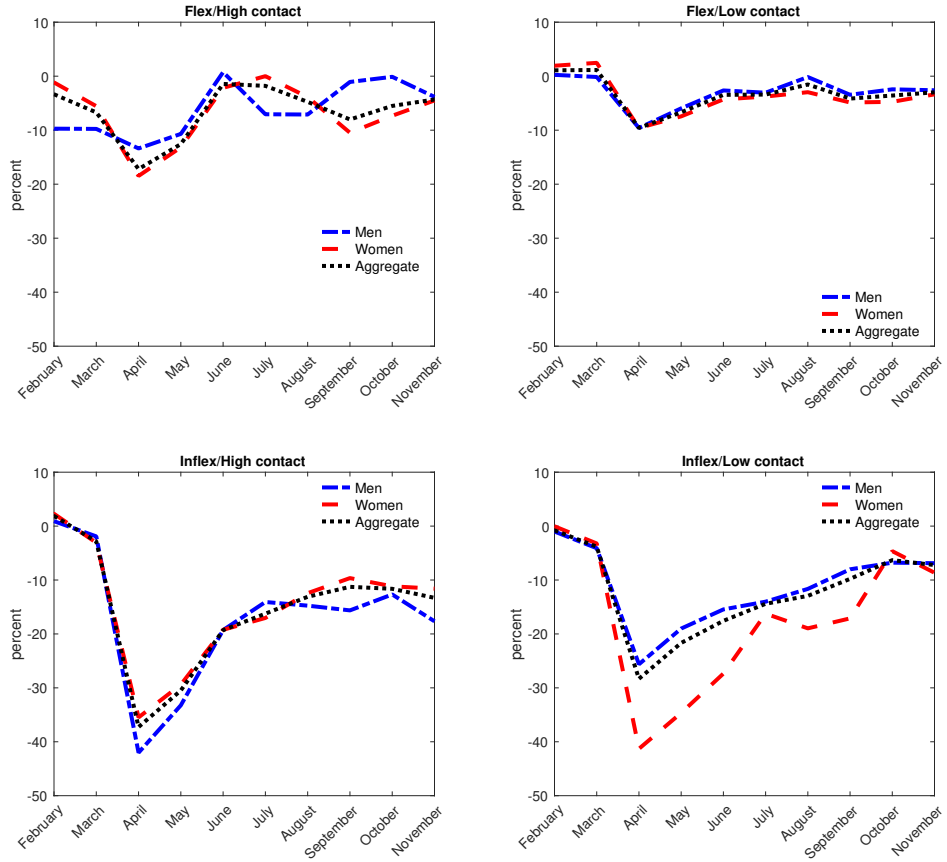


Figure 2: Percentage change in the employment-to-population ratio from one year prior in 2020. Source: Authors' calculations based on CPS.

Two patterns emerge from these results. First, for flexible/low-contact occupations, the recovery in employment was smaller for women. Though the difference by gender is small, it is still notable as this category accounts for the largest share of female employment, and therefore affects a large segment of the female workforce. The second pattern is that in inflexible occupations, workers with the lowest representation by gender lost more jobs. This may be due to negative selection of male workers into female dominated inflexible/high-contact occupations and of female workers into the

male dominated inflexible/low-contact occupations. Additionally, essential frontline workers are concentrated in inflexible/low-contact occupations and since, as documented in Blau, Koebe, and Meyerhofer (2020), they are more likely to be men, this may contribute to the greater decline of employment for women in this category.

Disentangling Demand and Supply

The behavior of employment over the course of the pandemic is driven by a combination of demand and supply factors. To disentangle these effects, we examine gross labor market flows. To capture the impact of demand factors, we consider the employment-to-unemployment flow, commonly interpreted as a measure of job destruction, which usually rises dramatically at the start of recessions. Since the unemployed are willing to but can't find work, the flows into unemployment are more associated with the number of jobs available in the labor market rather than individual workers' decisions to supply labor. In contrast, the flows into non-participation reflect workers' voluntary choices to leave labor market. To capture the impact of these labor supply factors, we consider the employment-to-nonparticipation flow, which captures voluntarily quits. Since the impact of the pandemic on these job flows are likely influenced by age and education, we adopt a regression approach that controls for age and education. We then estimate the impact of the pandemic on these flows with and without controlling for occupation, to quantify the role the occupational distribution. (See Albanesi and Kim (2021) for more detail.) The overall lesson that emerges is that while both supply-side and demand-side effects play a role in explaining the drop in employment to population ratio for women during the pandemic recession, supply-side factors related to marriage and children are associated with roughly about two-thirds of the shift, while occupational changes are associated with the other one third.

The estimates of the effect of the pandemic on these employment-to-unemployment and employment-to-nonparticipation flows by demographic group are reported in Table 3. Overall, we find that employment-to-unemployment flows rise by 2.9 percentage points in Phase 1 and 1.2 percentage points in Phase 2. Controlling for occupations lowers these values by one third in Phase 1. These are large changes, as on average monthly employment-to-unemployment flows range between 1.5-2 percentage points for men and 1-1.5 percentage points for women in 1976-2007 (Albanesi and Şahin (2018)).

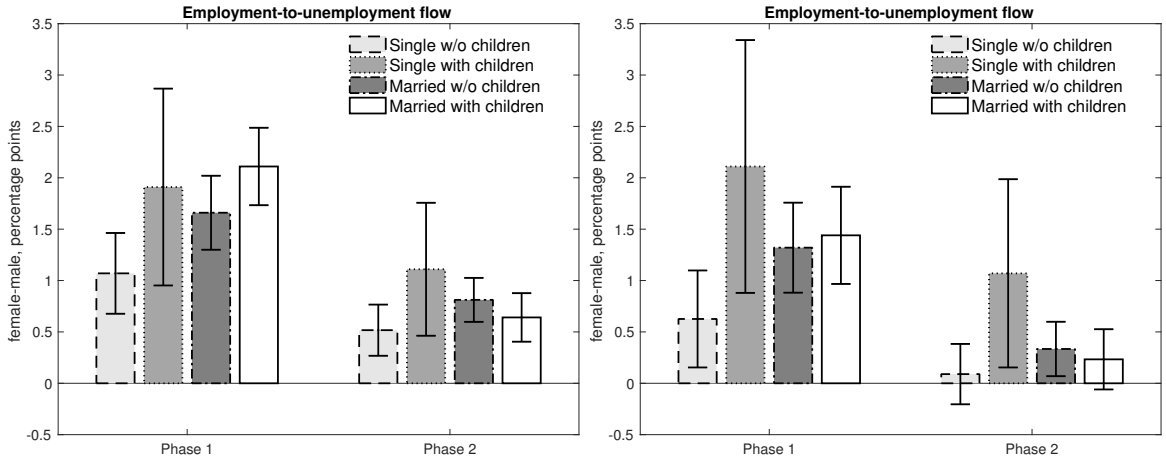
Women contribute to 65 percent of this rise in Phase 1 and 67 percent in Phase 2, much larger than their share in the population of 52 percent in February 2020. The female share declines only modestly in Phase 2 with occupation controls, suggesting that the occupation distribution plays a small role in accounting for gender gaps in the change in employment-to-unemployment flows. This can be seen in Figure 3 which reports the gender gaps by family status for this variable. These gaps are substantial for all demographic groups, ranging from 1 percentage point for single without children to 2.2 percentage points for married with children in Phase 1, and from 0.5 percentage

Table 3: Change in Gross Labor Flows During the Pandemic

	Employment-to-unemployment		Employment-to-nonparticipation	
	Phase 1	Phase2	Phase1	Phase2
Average without occupation controls	2.9	1.2	0.2	0.1
Share women	65.1	66.6	68.7	68.0
Average with occupation controls	1.8	1.1	0.2	0.1
Share women	66.8	58.5	55.4	85.0

Change in employment-to-unemployment and employment-to-non-participation flows relative to February 2020. Phases of the pandemic correspond to March to May for Phase 1, June to November for Phase 2. "Share women" is the fraction of the aggregate effect accounted for by women. All values in percentage. Source: Authors' calculations based on CPS.

points for single without children to 1.1 percentage points for single with children in Phase 2. Controlling for occupation, attenuates these gaps by at least a third for all categories except for single women with children in both phases of the pandemic. These results suggest that single women with children were disproportionately impacted by job losses during the pandemic, beyond the effects associated with their occupation distribution.

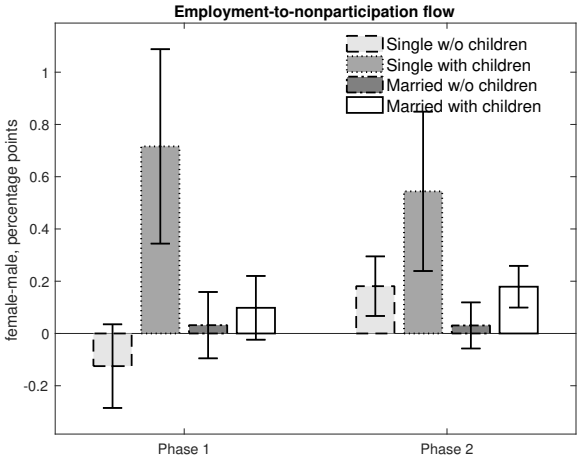


(a) Without occupation controls (b) With occupation controls

Figure 3: Female-male difference in changes in employment-to-unemployment flows since February 2020 by family status with and without occupation controls. See note to Table 3. Error bars denote 90% confidence intervals. Source: Author's calculations from CPS.

For the flows from employment into non-participation, we find a substantive rise during the pandemic with sizable gender differences. Employment-to-nonparticipation flows rose 0.2 percentage points in Phase 1, and by 0.1 percentage points in Phase 2, and 68 percent of this change is accounted for by women. This is a very large increase as the average for these flows have been 0.023 for men and 0.035 for women in recent years (Albanesi and Şahin (2018)). Controlling for occupa-

tion attenuates this rise only in Phase 1, and in Phase 2 increases the share of the rise accounted for by women. As shown in Figure 4 the gender differences in the change in the employment-to-nonparticipation flows are mostly driven by single women with children, for whom the rise is 0.7 percentage points higher than comparable men in Phase 1 and 0.6 percentage points higher in Phase 2. Married women with children also experience a a larger increase in this flow compared to men in the same demographic group in Phase 2. We present these estimates controlling for occupations, as there is little difference in the gender gaps by family status in the change in these flows with and without occupation controls, confirming that the occupational distribution plays a small role in accounting for gender differences in this variable.



(a) With occupation controls

Figure 4: Female-male difference in changes in employment-to-nonparticipation flows since February 2020 by family with occupation controls. See note to Table 3. Error bars denote 90% confidence intervals. Source: Author's calculations from CPS.

The disproportionate rise in flows into non-participation for women during the pandemic is striking, as it follows several decades of continued convergence in these flows across genders (Albanesi and Şahin (2018)). Historically, women have exhibited higher employment-to-nonparticipation flows than men, with most of the difference accounted for by men's higher rate of job to job transition, with the gap mostly accounted for by women's tendency to exit the labor force temporarily after the birth of a child (Royalty (1998)). However, as women's participation has grown, there has been a decline in their employment-to-nonparticipation transition rates. Additionally, as shown in Ellieroth (2019), these flows tend to fall for married women in recessions.

Will the Jobs Return?

As we look forward to the end of the pandemic, one critical question is whether employment will return to pre-pandemic level and jobs that were lost during the pandemic will be reinstated.

Since the 1990-1991 recession, the US has experienced "jobless recoveries," that is, even as GDP and aggregate demand rebound from the trough of the cycle, labor market indicators continue to stagnate and employment struggles to attain pre-recession levels. After the 1990-91 recession ended in March 1991, for example, it took until February 1993 for employment to reach its pre-recession peak. After the 2001 recession ended in November, employment only reached its pre-recession peak in October 2003. And after the Great Recession in June 2009, it took until May 2014 for total employment to reach its pre-recession peak.

Two main factors appear to be behind this phenomenon. First, Albanesi (2019) argues that the subdued behavior of employment during recoveries since the 1990s is driven by the flattening of female labor force participation. Recoveries before the 1990s have commonly been jobless for men, but as long as female labor force participation was rising briskly, female employment tended to grow very rapidly in recoveries. But as the rise in female participation slowed in the 1990s, the rate of growth of women's employment during recoveries has been similar to men's in the recessions since 1990-91. However, if the recovery from the pandemic is associated with a rebound of female participation to pre-pandemic levels, the rebound in aggregate employment may be faster compared to recent cycles.

However, a second explanation for jobless recoveries points in the opposite direction. The hypothesis is that the slow and incomplete rebound of aggregate employment is due structural change leading to a long-run decline in certain areas like manufacturing employment (Groshen and Potter (2003)) and routine jobs (Jaimovich and Siu (2020)). The job losses associated with these slow moving trends are concentrated in recessions, but then as the economy recovers, those jobs are not reinstated. This phenomenon affects primarily middle skill jobs which are particularly cyclical (Foote and Ryan (2015)), and is a key mechanism through which the trend toward job polarization (Acemoglu and Autor (2011)) has affected business cycles.

As we have argued, the pandemic has affected service occupations that in the past have seemed less amenable to automation. However, the pandemic has also given employers an additional incentive to embrace automation, an ongoing risk of infection that is expected to persist, as long as a substantial fraction of the world population remain susceptible to the coronavirus. Machines and software will not fall ill. Are jobs that were lost during the pandemic recession more or less susceptible to automation?

One way to measure the susceptibility to automation by occupation is Routine Task-Intensity (RTI), an index developed in Autor and Dorn (2013) that calculates the routine, manual, and abstract task inputs in each occupation based on job task requirements. Higher values of RTI correspond to higher susceptibility to automation. Earlier in this paper we focused on four main categories of occupations. We looked at the share of occupations in each group with above median RTI and the share of pre-pandemic employment accounted for by these occupations.

For inflexible/low-contact occupations, the most exposed to standard recessions, 22 percent of workers are employed in high-RTI jobs. For the inflexible/high-contact occupations, the category

Table 4: Susceptibility to Automation by Occupation

Occupation	Percent employed in High-RTI
Flexible, High-Contact	0.2
Flexible, Low-Contact	49.0
Inflexible, High-Contact	34.3
Inflexible, Low-Contact	22.0

All values in percentage. Source: Authors' calculations based on Autor and Dorn (2013).

most affected by the pandemic, 34 percent of workers are employed in high-RTI positions. The most automatable occupational category with 49 percent of employed in high-RTI jobs is the flexible/low-contact, as it includes Office and Administrative and Sales and Related occupations, which are cognitive and routine. The least automatable group of occupations is flexible/high-contact, comprised of Education, Training and Library occupations. Only 0.2 percent of workers are in highly automatable jobs in this category. These findings suggest that even health care and personal service occupations are susceptible to automation, leaving open the possibility that employment losses in those occupations may not be fully reversed as the broader economy recovers from the pandemic.[1]

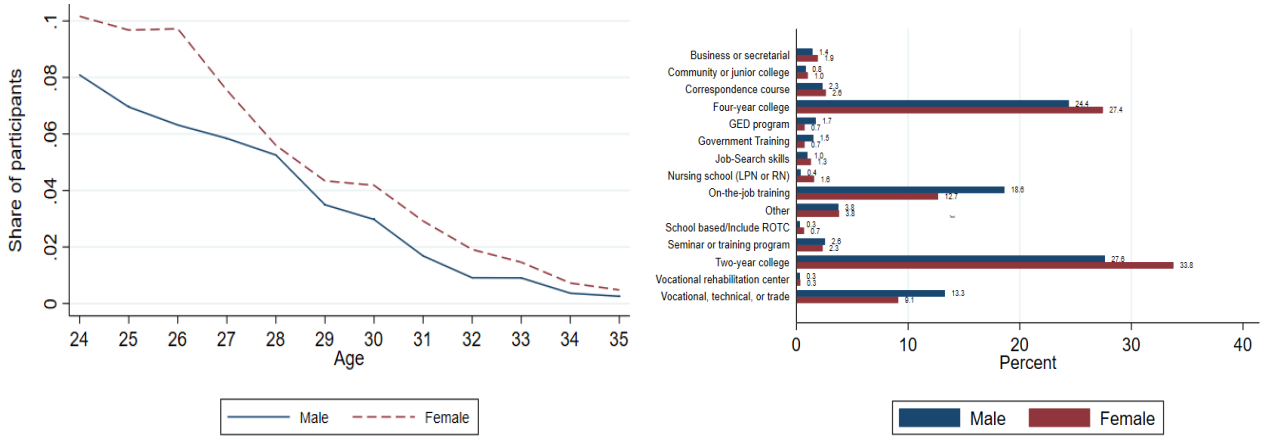
Remedies

The average length of a recession in the United States is 22 months. The Covid-19 pandemic is expected to last less than that, yet its impact on US labor markets could be more long lasting. In addition to the possibility that some of the jobs lost during the pandemic may not return due to the adoption of labor saving technologies, women's employment decline may continue beyond the pandemic. In the past, mothers who leave the labor force temporarily to take care of children have experienced substantial losses to wages and lifetime earnings. Adda, Dustmann, and Stevens (2017) estimate that the component of the child penalty associated with "atrophy" during spells of non-participation, due to human capital depreciation or skill obsolescence, accounts for 13% of the overall gender wage gap. These prospects may discourage reentry into the workforce. Additionally, employer investments in human capital and the career paths offered to women are affected by the expectation of career interruptions (Albanesi and Olivetti (2009)). After many decades of increasing labor market attachment for women (Goldin (2006)), the reduction in mothers' labor supply associated with the pandemic may reverse the slow progress made in this area.

Such effects will also interact with the extent to which remote work continues after the pandemic. Lack of flexibility has long been seen as a barrier to women's career advancement (Goldin (2014), Cortés and Pan (2019)). The increased ability to work remotely, which is expected to continue

[1]Some occupations do not have an RTI score. Specifically, the fraction of workers without an RTI score is 2 percent for flexible/low-contact, 8 percent for inflexible/high-contact occupations and 6 percent for inflexible/low-contact occupations.

after the pandemic (Barrero, Bloom, and Davis (2021)), when child care needs are normalized, may benefit women. However, even as remote work has grown for many workers during the pandemic, it has increased considerably more for women (Bick, Blandin, and Mertens (2020)). If it is mostly women who continue to take advantage of remote work arrangements, they may be stigmatized and miss out on career advancement opportunities, particularly in highly competitive professional and managerial occupations.



(a) Retraining rates by age

(b) Retraining rates by program

Figure 5: Retraining rates by gender, age and type of program. Source: Author's calculations from the National Longitudinal Survey of Youth 1997.

Retraining could help workers who have lost jobs and exited employment during the pandemic, by opening up career opportunities in other fields or offsetting human capital depreciation during spells of non-participation. Figure 5 reports the fraction of workers who enroll in retraining programs by age and gender from the 1997 wave of the National Longitudinal Survey of Youth. Women retrain at higher rates than men, but retraining rates drop substantially with age and the gender difference in retraining also shrinks for workers at around age 30. Kim (2020) shows that available savings is a key factor in retraining. Policies that incentivize workers beyond age 30 to retrain by reducing the costs of enrolling in certain programs could be extremely beneficial for the recovery from the pandemic. Figure 5 shows that women have a higher tendency to enroll in 2 or 4 year college programs, so incentives targeting these programs for non-conventional students may be particularly beneficial for women.

The benefits from retraining in terms of job opportunities and higher wages materialize only if participants are able to complete their programs. Non-conventional students face the challenge of managing childcare and other family responsibilities. Providing or subsidizing childcare services or after school programs may advance the ability of these students to complete their programs. While enhancing retraining opportunities may not yield immediate effects on employment as the pandemic ebbs, it is an investment that can lead to a more sustained labor market recovery. It will reduce

the mismatch between employment opportunities and skills among available workers, placing the economy in a better position to weather the continuing challenges from evolving technologies and business cycle fluctuations.

In the short run, one remedies that could prove powerful at increasing female employment, particularly on the supply side, is reducing marginal taxes on women. The United States system is gender neutral, however, marginal taxes on women are typically higher than on men through two main mechanisms. The first applies to married couples, who for the most part, file their taxes jointly. If wives are secondary earners, given the progressivity of the income tax, the marginal tax on their income is effectively higher than the marginal tax on their husbands higher income. The other mechanism that typically renders marginal taxes on women higher is the rapid phase-out of cash benefits as individual of family income increases (Diamond (1998)). If workers increase their hours, their income rises and they loose access to these benefits. This effect may be particularly prevalent for single women in low wage jobs, trapping them in a cycle of underemployment.

There is substantial evidence from the United States and other countries that reducing marginal taxes on women would increase their labor force participation and employment. Eissa (1996) and Eissa (1995) find that the 1980s tax reforms that reduced top marginal rates in the United States contributed to the rise in married women's participation over that period. Guner, Kaygusuz, and Ventura (2012) evaluate reforms to the U.S tax system and find that switching to a proportional system of a one in which married individuals file separately is accompanied by large increases in labor supply coming from married women. Bick and Fuchs-Schündeln (2017) evaluate the effects of taxing married women at the same rate as single women with the same wage, by switching to a system of separate taxation from joint taxation in a number of European countries and the US and find that it would lead to a substantial increase in married women's labor supply. Additionally, women have higher labor supply elasticity than men (Blundell and MaCurdy (1999) and Keane (2011)). From an optimal taxation standpoint, this implies that marginal taxes on women should be lower than on men (Alesina, Ichino, and Karabarbounis (2011)), not mostly higher as in the current system.

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