Federal Reserve Bank of Chicago

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REVISED
July 2021

WP 2020-19

https://doi.org/10.21033/wp-2020-19

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First draft September 2020; this version July 2021

Abstract

Recent studies have documented the disparate impact of the COVID-19 pandemic on labor market outcomes for different racial groups. This paper adds to this literature by documenting that the employment of Asian Americans - in particular those with no college education - has been especially hard hit by the economic crisis associated with the onset of the pandemic. This can only partly be explained by differences in demographics, local market conditions, and job characteristics, and it also cannot be entirely explained by possible different selection into education levels across ethnic groups. The burden on Asian Americans is primarily borne by those who are not US-born.

Key Words:Employment, Pandemic, Asian Americans, Racial Disparity.

JEL Code: J21, J70, J71.

*This research was supported by the Gregory C. Chow Econometric Research Program at Princeton University and by the National Science Foundation (Grant Number SES-1530741). We thank Laura Pilossoph and seminar participants at the Federal Reserve Bank of Chicago and System Applied Micro Conference and Day Ahead Conference for constructive and helpful comments. Daniel Aaronson and Brian Phelan generously shared the program for mapping occupations to job tasks. Aastha Rajan and Sharada Dharmasankar provided excellent research assistance. The opinions expressed here are those of the authors and not necessarily those of the Federal Reserve Bank of Chicago or the Federal Reserve System.

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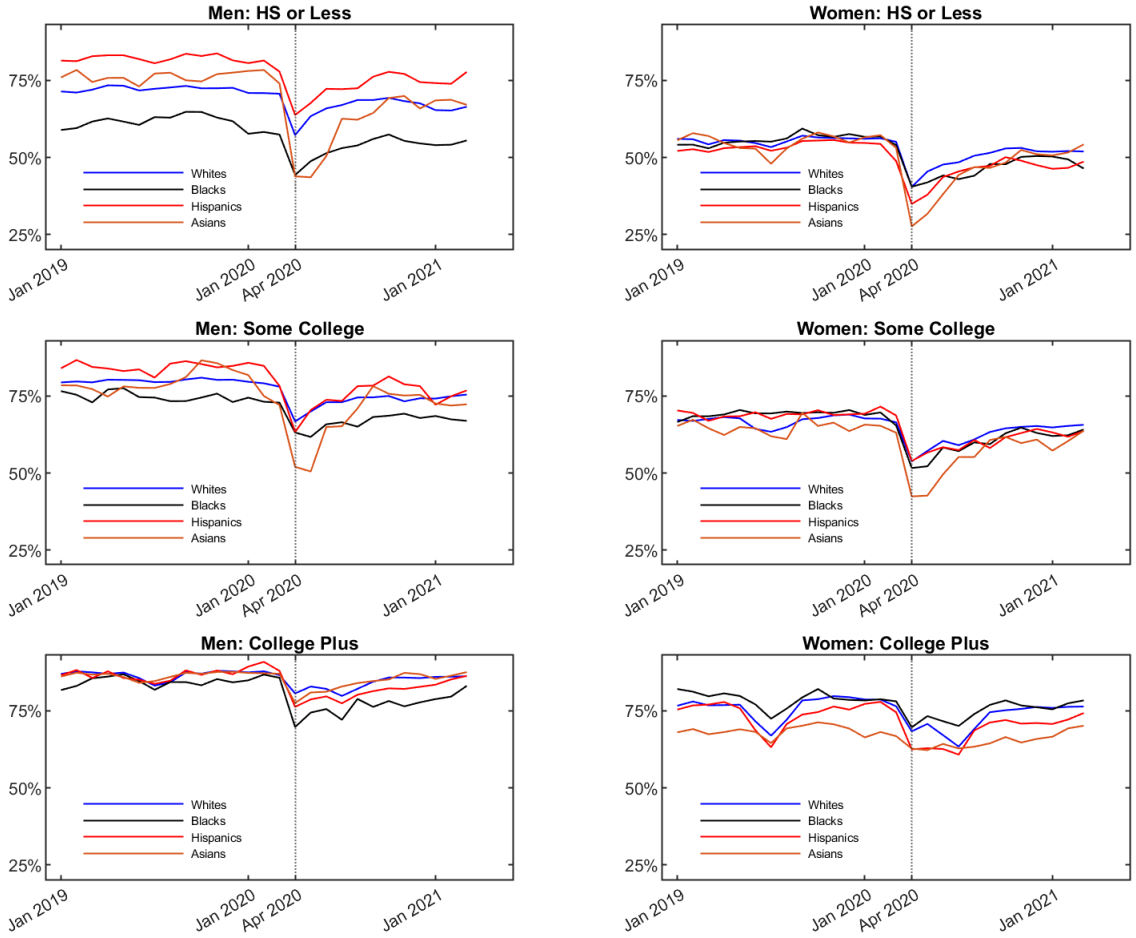
1 Introduction

A number of papers have documented the disparate impact of the COVID-19 pandemic on labor market outcomes across racial groups. This includes Bartik, Bertrand, Lin, Rothstein, and Unrath (2020), Cortes and Forsythe (2020), and Dam, Gaur, Karahan, Pilossoph, and Schirmer (2021). This literature has primarily focused on Blacks and Hispanics. At the same time, there is evidence that the health of Asian Americans in New York City was disproportionately impacted by the pandemic. See, for example, Marcello, Dolle, Tariq, Kaur, Wong, Curcio, Thachil, Yi, and Islam (2020). Finally, there has been increasing focus on Anti-Asian sentiment. The rhetoric surrounding the "China-virus" is a memorable example of this, and this has lead to the recent passing of the US Senate anti-Asian American hate crime bill (Wu (2021)). The contribution of this paper is to study the disparity across a broader group of ethnicities which includes Asian Americans. We find that Asian Americans were also disproportionately hard hit by the onset of the pandemic in terms of employment.

The simplest facts are displayed in Figure 1. The figure shows that the employment of minority groups (Blacks, Hispanics, and Asian Americans) was more negatively impacted by the pandemic than the employment of Whites. The decline in employment was sharpest at the start of the pandemic. For example, the employment rate for all men dropped by 9 percentage points from the first to the second quarter of 2020 and it only recovered by 5.8 percentage points from the second to the fourth quarter. While all groups experienced a fall in employment, the effect was most dramatic for low-educated Asian Americans. For example, Asian American men with a high school degree or less experienced a 31 percentage point drop in employment in the second quarter.

The empirical patterns regarding Asian American employment seem to have been largely overlooked. The report by Mar and Ong (2020) is a notable exception. They report aggregate statistics to compare the unemployment rate for Asian Americans and Whites before and after the onset of the crisis. The contribution of this paper is to use micro data to investigate the extent to which the different employment patterns across the groups (especially Asian Americans) reported above can be explained by differences in demographics, local labor market conditions, and job characteristics at the individual level. In order to allow for the

Figure 1: Fraction Working by Group



possibility that the labor market treatment of Asian Americans is related to their appearance, we initially disaggregate the group of Asian Americans into those of ("Chinese-looking") East Asian descent, those of South-East Asian descent, and the remaining group of Asians, and compare those groups to Whites, Blacks, and Hispanics.

We argue that the differences in the effect of the pandemic on employment cannot be explained by differences in other demographic characteristics or local labor market conditions. We document these findings in Section 2 below, and we demonstrate that the results are qualitatively robust to whether one uses a linear fixed effects estimator or a modified conditional logit maximum likelihood estimator that controls for fixed effects. In that section, we also compare the effects of the pandemic on different ethnic groups to the effects of the Great Recession. We find that in contrast to the pandemic, there was no notable difference in the

effects of the 2008 economic downturn on Asians-Americans and Whites. This is perhaps not surprising since the COVID-19 pandemic affected very different sectors of the economy than previous downturns.

In the current pandemic, some industries are considered "essential" and the employment in those industries has been impacted very differently from those considered non-essential. At the same time, it is easier to work from home in certain occupations than in others. Since workers of different ethnicities tend to work in different types of jobs, it is important to control for industry or occupation when estimating the differential impact on employment across different ethnicities. One problem with including industry or occupation as explanatory variables in a regression for the probability of working, however, is that individuals may answer questions about the industry or occupation in a way that depends on their current employment status. This will make variables for industry or occupation endogenous. In Section 3, we therefore focus on transitions in and out of employment controlling for an individual's industry and occupation in their previous interview month. We find that the large differential change in the probability of employment across ethnicity is mainly driven by differences in the probability of remaining employed and less by differences in the probability of gaining employment. We also find that differences in occupation and industry can explain up to half of the differential between Asians and Whites in the probability of remaining employed. For example, after controlling for other demographics, local labor market conditions, and occupation, low-educated East and South-East Asian American men experienced a 12 percentage point higher probability of losing their job in the second quarter of 2020 than comparable Whites. Without controlling for occupation, the corresponding number is 19 percentage points.

In Section 4, we explore various explanations for the remaining large differences between Asian Americans and other groups. One potential explanation is that the well-documented increase in Anti-Asian sentiments in the United States around the onset of the pandemic has lead to increased labor market discrimination against Asian Americans. Another possible difference between groups is household structure. For example, if Asian Americans are more likely to live in multi-generational households, then concerns for the health of older family members might make them more likely to withdraw from the labor market in response to the

pandemic. Finally, many Asian American are recent immigrants. This raises the question of whether the larger effect on Asian Americans is driven by their country of birth. A number of interesting findings emerge from the analysis in this section. First, we find no evidence that the differential impact on Asians is larger in occupations that are characterized by higher intensity of interpersonal tasks. We also do not find evidence that Asian Americans are especially hard hit in states with larger anti-Asian sentiments. Second, the patterns do not seem to be driven by individuals who stop working due to health concerns about elderly household members. Finally, we find that the impact on Asian Americans is largely borne by recent immigrants.

The effect of the pandemic on employment differs significantly across education groups as well as ethnicity. At the same time, Asian Americans tend to be higher educated than other groups. This raises the question of whether the especially large effect on low-educated Asian Americans is driven by different selection into educational attainment across ethnic groups. In Section 5, we find that this cannot fully explain the differences in the effect of the pandemic on employment across ethnic groups. Section 6 concludes the paper.

2 The Probability of Working

In this section, we first present some simple facts about the differences in employment outcomes across gender, education and ethnic groups before and during the pandemic. We then turn to simple regressions models that control for other observable factors.

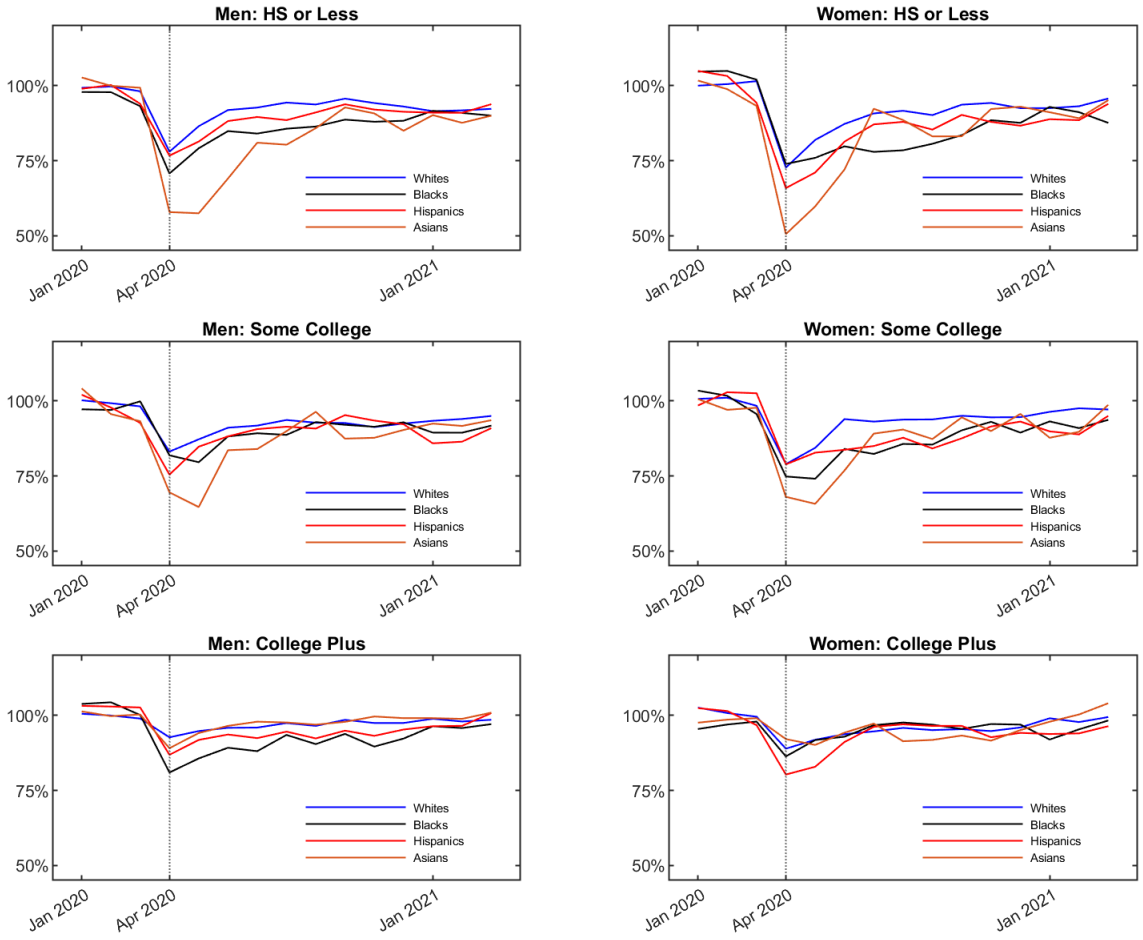
2.1 Data and Summary Statistics

We use the Current Population Survey (CPS) Basic Monthly micro data from January of 2019 to March of 2021, and restrict the data to individuals aged 25-65. We include data from 2019 as well as 2020 to control for seasonality in working that varies by ethnicity.

The simplest facts regarding employment were already displayed in Figure 1. The figure displays the fraction of each group that reports working between January 2019 and March

2021. [1] Overall, the employment rate for men declined by 9 percentage points in the second quarter of 2020 relative to the previous quarter. The minority groups, Blacks, Hispanics, and Asians, suffered steeper declines ranging between 10 and 14 percentage points. By the fourth quarter of 2020, the decline in employment for Asian Americans had recovered to close to that of Whites (at approximately a 2.5 percentage point lower than the first quarter of 2020), while the negative effects on Blacks and Hispanics persisted at more than 4 percentage points below their employment rate in the first quarter of 2020. The sharp decline in employment in the second quarter of 2020 is also evident from Figure 2, which displays the fraction of individuals employed in a given month relative to the same month in 2019.

Figure 2: Fraction Working by Group Relative to Same Month in 2019



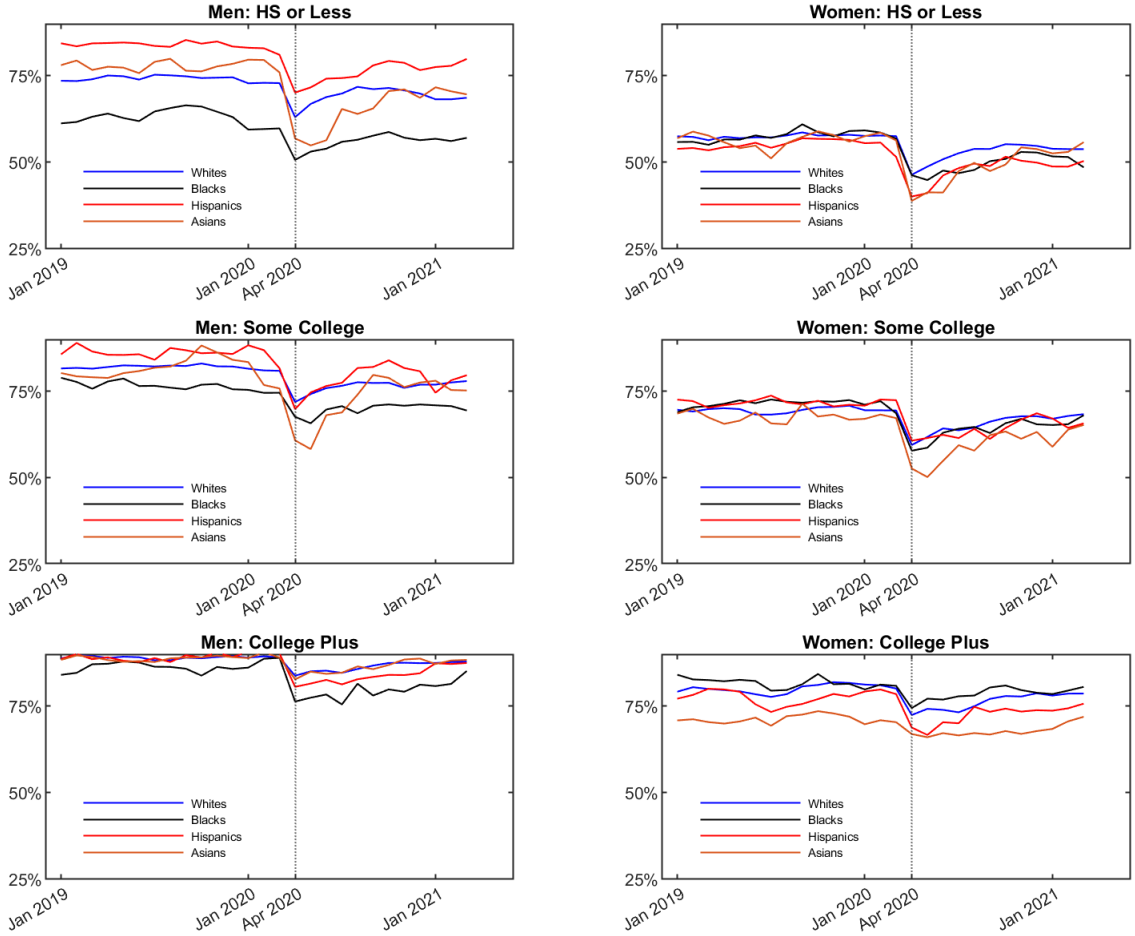
The most striking feature of Figures 1 and 2 is a dramatic decline in employment for

[1] Additional details are presented in the Appendix Tables 1 and 2.

Asian Americans with a high school degree or less. In the first quarter of 2020, 77% of Asian men in this group reported working. In the second quarter, the rate fell by 31 percentage points to 46%. By contrast, the changes for comparable Whites, Blacks and Hispanics were approximately 9, 10 and 12 percentage points, respectively. The patterns in the changes for women with a high school degree or less are similar to those for men.

These patterns found in Figure 1 also appear if one changes the definition of working to also include those who reported "has a job, but not at work last week". For both men and women, the largest drops in employment were for Asian Americans with a high school degree or less. The results are displayed in Figure 3 (See also Appendix Tables 3 and 4). For the rest of this paper, we focus on the first definition of working. The reason is that the alternative definition seems to be subject to a great deal of mis-classification since the beginning of the pandemic (See US Bureau of Labor Statistics (2020)).

Figure 3: Fraction Working by Group (Alt. Definition)



2.2 Controlling for Other Characteristics

In this subsection, we present the results from estimating linear probability models for the probability of working. We use data from April 2019 to March 2021 (covering twelve months before the onset of the pandemic and twelve months after). Our main goal is to document how working depends on ethnicity before and during the pandemic. Since Asian Americans are a very heterogeneous group, we initially disaggregate the group into three categories: East Asians ("AsianE" in the tables), South-East Asians ("AsianSE"), and other Asians ("AsianOther").[2] The variables of interest will be ethnicity dummies and - especially - their interactions with the COVID periods, starting with the second quarter of 2020 (the pandemic quarters). Below, and in the tables, we refer to the last three quarters of 2020 and the first quarter of 2021 as "Cr2", "Cr3", "Cr4", and "Cr5".

Whether someone is working is likely to be influenced by the demographic characteristics of the individual. Therefore, for each combination of sex and educational group, we estimate a linear probability model for working that controls for age, age squared, marital status, number of children, number of children under the age of 5, and interactions between indicators of (a) each month of the year, (b) state of residence, and (c) each of the pandemic months starting in April of 2020. This controls for geographic variation in the impact of the pandemic on the local economy.

To allow for the possibility that the seasonal effects differ by group, we include interactions between indicators of (a) each quarter of the year, (b) each ethnicity, and (c) each pandemic quarter starting with the second quarter of 2020. The parameters of interest are the coefficients on the interactions between the ethnicity variables and pandemic quarters.

The estimated coefficients for the key parameters of interest are reported in Table 1.[3] The

[2]We define AsianAll based on the IPUMS CPS variable "race". Specifically, AsianAll equals 1 if race is either recorded as "asian only", "hawaiian/pacific islander only", "white-asian", or "black-asian". AsianAll is divided into three groups: AsianE, AsianSE and AsianOther. The first is the subset that are either born, or has a parent born, in Japan, North Korea, Taiwan, Hong Kong, South Korea, Mongolia, China or Macau. The second is the subset that are not in AsianE and are either born, or has a parent born, in Brunei, Cambodia, Indonesia, Laos, Malaysia, Burma, Myanmar, Philippines, Singapore, Thailand, Timor Leste, or Vietnam. The third group, AsianOther, is the remaining set.

[3]We use the population weights from the CPS. The standard errors for all the regressions are clustered at the household level. This accounts for within-household correlation in unobservables. It also accounts for the fact that the CPS has a panel structure, with individuals being interviewed for four consecutive months,

results in Table 1 are most striking for individuals with a high school degree or less (the first and fourth columns). Generally speaking, Asian Americans in this group were much harder hit by the pandemic than any other group. This is especially true in the second quarter of 2020, and particularly for East and South East Asians. Controlling for demographics, East Asian men and women have an estimated additional 21 and 16 percentage point drop in the probability of working in the second quarter relative to their white counterparts[4]. The point estimates for the corresponding drop in the probability of working between the first and third quarter were approximately 12 and 6 percentage points. This pattern also holds for South East Asians, although to a lesser degree. The differentials between Whites and Blacks or Hispanics are generally much smaller.

The results for the top end of the educational attainment distribution (columns 3 and 6 of Table 1) are very different. For men with a college degree or more, the decline in employment is similar across ethnic groups, with the exception that Blacks suffered a larger decline than the other groups. For women in this educational group, East Asians stand out for having experienced the largest declines, while the other groups are quite similar. The magnitudes of the differences between ethnic groups are dwarfed, however, by the differences for the lower end of the education distribution.

Since the largest differential effects of the pandemic by ethnicity were in the first two quarters of the pandemic ("Cr2" and "Cr3"), we only report estimates associated with those two quarters in the remainder of the paper.

It is clear from Table 1 that the magnitudes of the estimated effects for East Asians and South East Asians are quite different. On the other hand, the overall patterns are similar. Moreover, some of the estimates are noisy when we restrict estimation to the subsample of individuals with a high school degree or less. Table 2 presents the results for the same model as in Table 1, but with East Asians and South East Asians merged into one group, "AsianEast". As expected, the overall pattern is the same, with the point estimates for "AsianEast" of the same magnitude as the point estimates for the dis-aggregated East and

not interviewed for eight, and then again interviewed for another four months.

[4]For comparison, the probability of working in the quarter prior to the onset of the pandemic was 72% and 54% for two groups.

Table 1: Controlling for Demographics and Time-varying Labor Market Conditions

	Men HS or less	Men Some Coll.	Men College+	Women HS or less	Women Some Coll.	Women College+
Black*Cr2	-0.029	-0.031	-0.077	-0.024	-0.061	-0.008
	(0.018)	(0.021)	(0.019)	(0.018)	(0.020)	(0.016)
Hispanic*Cr2	-0.043	-0.042	-0.017	-0.038	-0.020	-0.041
	(0.013)	(0.020)	(0.018)	(0.016)	(0.020)	(0.019)
AsianE*Cr2	-0.211	-0.120	0.006	-0.155	-0.156	-0.022
	(0.060)	(0.066)	(0.025)	(0.048)	(0.064)	(0.027)
AsianSE*Cr2	-0.180	-0.140	-0.050	-0.208	-0.035	-0.003
	(0.043)	(0.045)	(0.034)	(0.040)	(0.049)	(0.030)
AsianOther*Cr2	-0.160	-0.048	0.016	0.088	-0.070	0.054
	(0.041)	(0.049)	(0.018)	(0.043)	(0.054)	(0.024)
Black*Cr3	-0.051	-0.015	-0.049	-0.068	-0.066	0.009
	(0.017)	(0.021)	(0.018)	(0.018)	(0.019)	(0.016)
Hispanic*Cr3	-0.033	-0.014	-0.021	-0.011	-0.054	0.011
	(0.013)	(0.018)	(0.017)	(0.015)	(0.020)	(0.017)
AsianE*Cr3	-0.119	0.027	0.042	-0.061	-0.054	0.013
	(0.061)	(0.066)	(0.023)	(0.049)	(0.065)	(0.025)
AsianSE*Cr3	-0.082	-0.019	-0.028	-0.027	0.018	-0.017
	(0.042)	(0.047)	(0.034)	(0.044)	(0.046)	(0.027)
AsianOther*Cr3	-0.050	-0.010	0.026	0.107	-0.019	-0.016
	(0.040)	(0.047)	(0.015)	(0.046)	(0.058)	(0.024)
Black*Cr4	-0.035	0.009	-0.044	-0.043	-0.030	0.009
	(0.016)	(0.019)	(0.017)	(0.018)	(0.018)	(0.015)
Hispanic*Cr4	-0.015	0.016	-0.029	-0.023	-0.036	0.000
	(0.012)	(0.018)	(0.016)	(0.015)	(0.019)	(0.017)
AsianE*Cr4	-0.100	-0.074	0.009	-0.070	-0.032	0.012
	(0.061)	(0.055)	(0.022)	(0.050)	(0.063)	(0.026)
AsianSE*Cr4	0.020	0.009	-0.007	0.014	-0.072	-0.089
	(0.036)	(0.038)	(0.027)	(0.041)	(0.046)	(0.027)
AsianOther*Cr4	-0.033	-0.009	0.031	0.018	0.082	0.023
	(0.040)	(0.046)	(0.017)	(0.046)	(0.051)	(0.024)
Black*Cr5	0.013	-0.017	-0.036	-0.033	-0.038	0.002
	(0.017)	(0.020)	(0.016)	(0.018)	(0.018)	(0.015)
Hispanic*Cr5	0.010	-0.035	-0.031	-0.012	-0.033	-0.014
	(0.012)	(0.018)	(0.015)	(0.015)	(0.020)	(0.017)
AsianE*Cr5	-0.083	-0.070	0.002	-0.068	0.020	0.010
	(0.055)	(0.068)	(0.023)	(0.054)	(0.056)	(0.024)
AsianSE*Cr5	0.023	0.001	0.020	0.057	0.012	0.015
	(0.034)	(0.038)	(0.025)	(0.040)	(0.041)	(0.027)
AsianOther*Cr5	-0.049	0.016	0.017	0.039	-0.023	0.058
	(0.039)	(0.051)	(0.015)	(0.045)	(0.048)	(0.023)
Observations	253,718	167,370	235,258	223,847	193,556	288,601

Robust standard errors are clustered at the household level. Coefficients for Age, Age^2, Marital Status, No. of Children, No. of Children under 5 and Main Effects not reported. Fixed effects for each combination of state and month starting in April 2020 included. Cr2, Cr3, Cr4, and Cr5 refer to the second quarter of 2020 through the first quarter of 2021.

South East Asians. Also as expected, the coefficients on "AsianEast" are more precisely estimated than when this group is dis-aggregated. For most of the rest of the paper, we therefore aggregate East and South East Asian Americans into one group.

Table 2: Main Results Combining East and South East Asians.

	Men HS or less	Men Some Coll.	Men College+	Women HS or less	Women Some Coll.	Women College+
AsianEast*Cr2	-0.192	-0.134	-0.015	-0.188	-0.075	-0.015
	(0.035)	(0.038)	(0.021)	(0.031)	(0.040)	(0.021)
AsianEast*Cr3	-0.097	0.000	0.018	-0.051	-0.005	-0.000
	(0.036)	(0.039)	(0.020)	(0.034)	(0.039)	(0.019)
Observations	253,718	167,370	235,258	223,847	193,556	288,601

*Same specification as in Table 1.

2.3 Logit or Linear Probability Model?

The outcome "working" is binary. This leads to the question of whether the fixed effects linear probability model will adequately capture its relationship with the explanatory variables. In this section, we therefore report the results from estimating a logit version of the model in Table 2. This is less straightforward than it might seem. On one hand, estimating a coefficient for each fixed effect could be challenging because of the incidental parameters problem.[5] On the other hand, the traditional conditional likelihood approach to eliminating the fixed effects is computationally infeasible in this case. We therefore use a modified version of the conditional likelihood approach.

The point of departure for our approach is the familiar fixed effects logit model pioneered by Rasch (1960, 1961). Specifically, let i index a group of observations with a particular value of the state-month combination, and let j denote an observation within group i. We assume that the dependent variable, y (working), for observation j in group i is independent conditional on the explanatory variables and on a group-specific effect. We also assume that

[5]See, for example, Arellano and Hahn (2007) for a discussion of how incident parameter can be a problem when the number of observations per group is large, but small relative to the sample size.

the distribution of each y is

$$P\left(y_{ij}=1|\left\{x_{ij}\right\}_{j=1}^{J_i},\alpha_i\right)=\frac{\exp\left(x_{ij}'\beta+\alpha_i\right)}{1+\exp\left(x_{ij}'\beta+\alpha_i\right)}=\Lambda\left(x_{ij}'\beta+\alpha_i\right), \tag{1}$$

where $\Lambda(\cdot)$ the logistic cumulative distribution function and J_i denotes the number of observations in group i.

In this case, the distribution of $(y_{i1},\ldots,y_{iJ_i})$ conditional on $(x_{i1},\ldots,x_{iJ_i})$ and on $\sum_{j=1}^{J_i}y_{ij}$ is

$$P\left(\left\{y_{ij}\right\}_{j=1}^{J_i}=\left\{c_{ij}\right\}_{j=1}^{J_i}\middle|\left\{x_{ij}\right\}_{j=1}^{J_i},\sum_{j=1}^{J_i}y_{ij}=\sum_{j=1}^{J_i}c_{ij}\right)=\frac{\exp\left(\sum_{j=1}^{J_i}c_{ij}x_{ij}'\beta\right)}{\sum_{d_j\in\mathcal{B}_i}\exp\left(\sum_{j=1}^{J_i}d_jx_{ij}'\beta\right)}, \tag{2}$$

where $c_{it}\in\{0,1\}$ and $\mathcal{B}_i=\left\{(d_1,...,d_{J_i}):d_j\in\{0,1\},\sum_{j=1}^{J_i}d_t=\sum_{j=1}^{J_i}c_{ij}\right\}$.

One could, in principle, estimate β by maximizing a conditional likelihood function based on (2). This, however, would be extremely computationally intensive. For example, our sample of women with a college degree or more contains a group (state-month combination) with 13,627 observations of whom 9,835 reported working. This means that for this group, the number of terms in the denominator of (2) is $\binom{13,627}{9,835}$, which is of the order of magnitude of 10^{3500}. This makes estimation based on the likelihood function in (2) infeasible. We therefore note that for any two individuals in group i, j_1 and j_2,

$$P\left(y_{ij_1}=1|\,x_{ij_1}x_{ij_2},y_{ij_1}+y_{ij_2}=1\right)=\frac{\exp\left(\left(x_{ij_1}-x_{ij_2}\right)'\beta\right)}{1+\exp\left(\left(x_{ij_1}-x_{ij_2}\right)'\beta\right)}.$$

This can be used to form a likelihood function based on pairs of observations within each group. In principle, one could use all pairs of (j_1,j_2) in a group, but this can be computationally demanding. We therefore pair each observation for whom $y_{ij_1}=1$ with a randomly chosen observation (ij_2) with $y_{ij_2}=0$ in the same group. We also pair each observation for whom $y_{ij_1}=0$ with a randomly chosen observation with $y_{ij_2}=1$ in the same group. The

estimator of β is then based on maximizing the pseudo log-likelihood function

$$\sum_{i=1}^{n}\sum_{j_1=1}^{J_i}\log\frac{\exp\left(y_{ij_1}\left(x_{ij_1}-x_{ij_2}\right)'b\right)}{1+\exp\left(\left(x_{ij_1}-x_{ij_2}\right)'b\right)}$$

over b.

Table 3 displays the estimated coefficient in a fixed effects logit version of the model in Table 2.[6] The conclusions to be drawn from the logit estimates are not substantially different from those reported in Section 2. Consider, for example, a heterogeneous population of East Asians in which the probability of working prior to the pandemic is uniformly distributed between 50% and 90%[7]. The estimated average effects of the pandemic on the probability of working (relative to the effect for Whites with the same education and gender) for this population are declines in the probability of working by 15.4, 13.5, 1.8, 18.7, 7.3, and 1.2 percentage points across the six combinations of education and gender. These are quite similar to the results for the linear probability model in Table 2. For the rest of the paper, we therefore use the linear probability model.

Table 3: Main Results Combining East and South East Asians (Logit).

	Men HS or less	Men Some Coll.	Men College+	Women HS or less	Women Some Coll.	Women College+
AsianEast*Cr2	-0.717	-0.632	-0.091	-0.861	-0.354	-0.059
	(0.154)	(0.235)	(0.137)	(0.139)	(0.142)	(0.109)
AsianEast*Cr3	-0.468	0.030	0.139	-0.246	-0.053	0.036
	(0.169)	(0.179)	(0.146)	(0.112)	(0.138)	(0.115)
Observations	253,718	167,370	235,258	223,847	193,556	288,601

2.4 Comparison to the 2008 Recession

It is difficult to know the mechanisms behind the dramatic impact on Asians, especially East Asians, with lower educational attainment. One possibility is that this is a typical feature of

[6]The standard errors reported in Table 3 account for the group structure, but they are not clustered at the household level. The estimation also does not employ sampling weights.

[7]The marginal effects in a logit differ across observations with different explanatory variables. The overall probability of working is roughly 70% and we therefore report an average marginal effect across individuals with probabilities between 50% and 90%.

economic downturns. In order to investigate this possibility, we estimate the same model as in Table 1 using data from 2006 through 2011, with the crisis variable defined as a dummy variable for the "Crisis" years 2008, 2009, 2010 and 2011. The results are presented in Table 4.[8] They suggest that there is generally no differential in the impact of the recession between Asians and Whites. This is in sharp contrast to the COVID-19 crisis. The maximum T-statistic of the 18 coefficients that measure the differential Asian-versus-White impact of the crisis is around 2.5, and a joint test of significance across all 6 combinations of education and gender yields a chi-square test statistic of around 14. Compared to a chi-square distribution with 18 degrees of freedom, this is statistically very insignificant.

Table 4: 2008 Recession

	Men HS or less	Men Some Coll.	Men College+	Women HS or less	Women Some Coll.	Women College+
Black	-0.110	-0.076	-0.039	-0.039	-0.003	0.039
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Hispanic	0.037	-0.007	-0.009	-0.070	0.001	-0.017
	(0.004)	(0.006)	(0.006)	(0.006)	(0.007)	(0.008)
AsianE	0.013	-0.040	-0.033	0.001	-0.077	-0.078
	(0.016)	(0.020)	(0.008)	(0.016)	(0.021)	(0.011)
AsianSE	-0.005	-0.038	-0.040	0.001	0.035	0.046
	(0.014)	(0.015)	(0.011)	(0.015)	(0.016)	(0.011)
AsianOther	-0.000	0.011	-0.005	-0.108	-0.021	-0.119
	(0.016)	(0.014)	(0.007)	(0.018)	(0.021)	(0.013)
Black*Crisis	-0.005	-0.019	-0.027	-0.019	-0.016	-0.036
	(0.007)	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)
Hispanic*Crisis	-0.012	0.001	-0.009	-0.006	-0.014	-0.006
	(0.005)	(0.007)	(0.007)	(0.007)	(0.009)	(0.010)
AsianE*Crisis	0.038	-0.010	-0.013	0.003	0.001	-0.011
	(0.019)	(0.025)	(0.011)	(0.019)	(0.025)	(0.014)
AsianSE*Crisis	0.001	0.017	0.003	0.007	0.017	-0.018
	(0.017)	(0.018)	(0.013)	(0.018)	(0.020)	(0.014)
AsianOther*Crisis	-0.008	-0.006	-0.011	-0.000	-0.032	0.004
	(0.020)	(0.018)	(0.009)	(0.022)	(0.026)	(0.015)
Observations	1,042,906	641,817	781,625	1,013,730	773,306	862,519

[8]Here, we allow for different effects for East Asians and South East Asians since the sample sizes are much larger than what we consider for the COVID-19 pandemic.

3 Transition In and Out of Employment

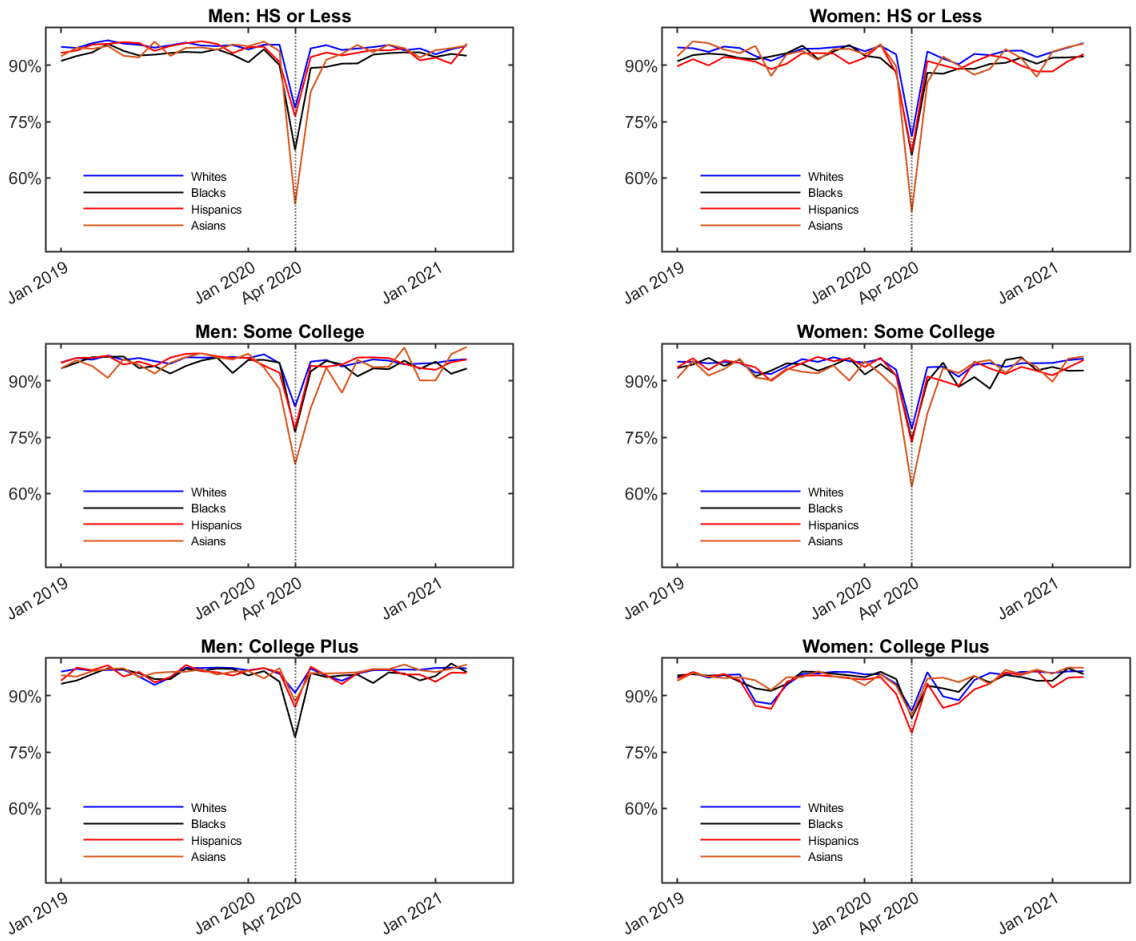
The analysis in Section 2 focused on the probability of working. We now turn to the probability of working conditional on whether the individual worked in the previous month. There are two distinct motivations for this. The first is that it is economically interesting to know whether the large decline in the probability of working for Asian Americans is driven by the probability that the employed stopped working or by the probability that those not employed started working. The second motivation is that it is interesting to investigate how the empirical results in Section 2 change if one controls for industry and/or occupation. The Current Population Survey does include information on the industry and occupation to which an individual belongs. In principle, these variables should be well-defined whether or not an individual is currently working as long as they have worked in the past. As such, it should only be missing for individuals who have no attachment to the labor market, and one thus might be able to justify ignoring those individuals from the empirical analysis. However, if – contrary to protocol – the non-response to the questions about industry or occupation is a direct result of not working, then ignoring those individuals will result in selection bias. Indeed, we find strong evidence that non-response to the questions about industry or occupation is caused by not working. For example, consider individuals who worked in the previous month, and hence should in principle report industry and occupation status in the current month regardless of their current employment status. In this group, 30% of those not currently working report occupation as missing. The corresponding number for industry is 28%. One solution to this problem is to use lagged industry or occupation as an explanatory variable, but whether this variable is missing might be the consequence of lagged unemployment, which in turn could be highly correlated with current employment status. Again, this could lead to endogeneity in whether or not lagged industry or occupation is missing. In contrast, the transitions in and out of employment are much more likely to be driven by recent events which are less likely to be related to whether or not lagged industry or occupation is missing. This is our second motivation for now focusing on transitions.

The basic findings regarding month-to-month transitions out of employment are presented in Figures 4 and 5. Figure 4 displays the fraction of individuals working in the

previous month, who are also working in the current month for Whites, Blacks, Hispanics and Asians (combined across all sub-groups). The figure shows a large drop in the probability of remaining employed in April of 2020 for all groups. The decline is larger for those without a college degree and especially large for Asian-Americans.

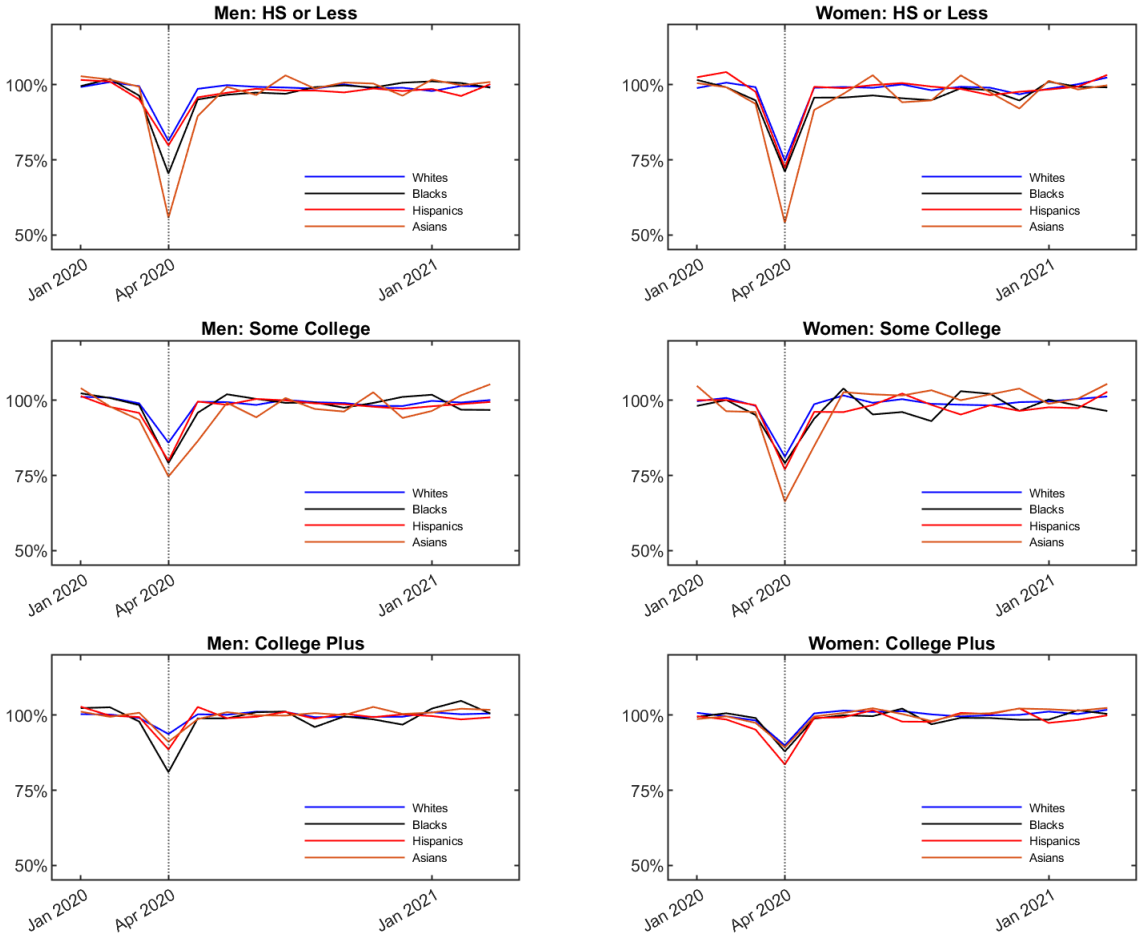
The 2019 part of the figures illustrate that seasonality might play a role. In Figure 5, we therefore plot the probability of remaining employed in a given month relative to the probability in the same month in 2019. The same pattern emerges: Asian-Americans without a college degree experienced the biggest job loss.

Figure 4: Fraction Remaining at Work by Group



The corresponding figures for the monthly probability of being employed condition on not being employed in previous month are based on much smaller sample sizes and therefore too noisy to be informative, and we therefore turn to regressions. We first estimate the

Figure 5: Fraction Remaining at Work by Group Relative to Same Month in 2019



econometric model for working from Section 2 separately for the samples of individuals who were or were not working in the previous month. The results are presented in Tables 5 and 6.

Table 5 confirms the results in Figures 4 and 5. After controlling for demographics, Asian-Americans without a college degree suffered larger job loss in the second quarter of 2020 than other groups. The estimated effects on the probability of entering employment reported in Table 6 tend to be statistically insignificant.

We now turn to the fact that some industries and occupations were particularly hard hit by the pandemic. This could lead to omitted variable bias if Asian Americans tend to work in those industries or occupations. For example, in the sample used below, East Asians are overrepresented in the occupation "hosts and hostesses, restaurant, lounge, and coffee shop"

Table 5: Remaining Employed

	Men HS or less	Men Some Coll.	Men College+	Women HS or less	Women Some Coll.	Women College+
Black*Cr2	-0.054	-0.030	-0.054	-0.022	-0.016	-0.013
	(0.016)	(0.016)	(0.015)	(0.019)	(0.016)	(0.013)
Hispanic*Cr2	-0.026	-0.021	-0.012	-0.009	-0.042	-0.028
	(0.011)	(0.014)	(0.011)	(0.016)	(0.016)	(0.015)
AsianEast*Cr2	-0.191	-0.063	-0.018	-0.182	-0.074	-0.021
	(0.040)	(0.037)	(0.014)	(0.041)	(0.039)	(0.014)
AsianOther*Cr2	-0.070	-0.088	-0.003	-0.021	-0.119	0.020
	(0.040)	(0.041)	(0.010)	(0.044)	(0.050)	(0.015)
Black*Cr3	-0.011	0.004	-0.005	-0.033	-0.049	-0.010
	(0.013)	(0.014)	(0.012)	(0.016)	(0.015)	(0.011)
Hispanic*Cr3	-0.004	0.005	-0.003	0.008	0.003	-0.019
	(0.009)	(0.011)	(0.011)	(0.013)	(0.014)	(0.014)
AsianEast*Cr3	-0.006	-0.028	-0.006	-0.054	0.001	-0.006
	(0.021)	(0.028)	(0.011)	(0.029)	(0.024)	(0.012)
AsianOther*Cr3	0.019	-0.003	0.003	0.078	0.093	0.005
	(0.027)	(0.031)	(0.010)	(0.052)	(0.030)	(0.017)
Observations	121,000	89,044	139,353	79,880	86,877	148,575

Table 6: Transition Into Employment

	Men HS or less	Men Some Coll.	Men College+	Women HS or less	Women Some Coll.	Women College+
Black*Cr2	-0.006	-0.010	0.058	-0.013	-0.052	-0.041
	(0.018)	(0.034)	(0.049)	(0.015)	(0.020)	(0.031)
Hispanic*Cr2	0.005	-0.058	0.028	-0.021	-0.027	0.011
	(0.023)	(0.038)	(0.053)	(0.012)	(0.023)	(0.027)
AsianEast*Cr2	-0.037	-0.039	-0.000	-0.007	-0.071	0.014
	(0.043)	(0.057)	(0.053)	(0.027)	(0.039)	(0.027)
AsianOther*Cr2	-0.248	0.005	0.061	0.005	0.060	0.011
	(0.069)	(0.069)	(0.053)	(0.030)	(0.048)	(0.025)
Black*Cr3	0.024	-0.040	-0.024	-0.002	0.024	0.033
	(0.019)	(0.033)	(0.045)	(0.016)	(0.022)	(0.030)
Hispanic*Cr3	-0.009	-0.002	0.035	-0.003	-0.017	0.026
	(0.024)	(0.042)	(0.052)	(0.014)	(0.025)	(0.027)
AsianEast*Cr3	0.040	0.066	0.014	0.056	0.042	0.003
	(0.050)	(0.070)	(0.050)	(0.032)	(0.043)	(0.029)
AsianOther*Cr3	-0.116	0.006	0.061	0.053	-0.224	0.016
	(0.072)	(0.068)	(0.065)	(0.039)	(0.061)	(0.027)
Observations	52,476	26,976	24,118	72,926	46,894	51,916

by a factor of 3 relative to the rest of the population. In the group with a high school degree or less, the difference becomes a factor of almost 5. In order to control for the potential resulting omitted variable bias in the estimate for being Asian-American, we include a fixed

effects for interactions between occupation (including "missing") and pandemic months. The results are presented in Tables 7 and 8.[9]

Table 7: Remaining Employed Controlling for Time-varying Effects of Occupation

	Men HS or less	Men Some Coll.	Men College+	Women HS or less	Women Some Coll.	Women College+
Black*Cr2	-0.037	-0.003	-0.043	-0.037	-0.010	-0.013
	(0.017)	(0.015)	(0.014)	(0.019)	(0.015)	(0.012)
Hispanic*Cr2	-0.015	-0.020	-0.010	0.014	-0.026	-0.018
	(0.011)	(0.014)	(0.011)	(0.017)	(0.016)	(0.014)
AsianEast*Cr2	-0.120	-0.067	-0.012	-0.081	-0.046	-0.020
	(0.041)	(0.037)	(0.014)	(0.039)	(0.036)	(0.014)
AsianOther*Cr2	-0.060	-0.097	-0.013	-0.025	-0.083	0.018
	(0.040)	(0.041)	(0.010)	(0.045)	(0.045)	(0.015)
Black*Cr3	-0.010	-0.004	-0.006	-0.036	-0.049	-0.016
	(0.014)	(0.015)	(0.013)	(0.017)	(0.015)	(0.012)
Hispanic*Cr3	-0.003	0.004	-0.006	0.011	0.003	-0.015
	(0.009)	(0.011)	(0.011)	(0.015)	(0.014)	(0.014)
AsianEast*Cr3	-0.011	-0.021	-0.010	-0.050	-0.010	-0.018
	(0.021)	(0.028)	(0.011)	(0.029)	(0.024)	(0.012)
AsianOther*Cr3	0.014	-0.008	0.000	0.065	0.100	-0.003
	(0.029)	(0.033)	(0.010)	(0.051)	(0.032)	(0.018)
Observations	121,000	89,044	139,353	79,880	86,877	148,575

A comparison of the results in Tables 5 and 7 reveals that an individual's occupation can explain up to approximately half of the difference between Whites and the two groups of Asian Americans. For example, for East and South-East Asian American men with a high school degree or less, the estimated effect on the probability of remaining employed (relative to comparable Whites) is reduced from -0.19 to -0.12 when one controls for time-varying occupation effects. The corresponding reduction for women is from -0.18 to -0.08.

The same comparison for the probability of entering employment (Tables 6 and 8) suggests that controlling for occupation makes only a small difference relative to the estimation uncertainty.

[9]We repeated the same exercise using industry rather than occupation. The results are very similar, although it appears that controlling for occupation makes the bigger difference. We refrain from using all combinations of industry, occupation, and month because this would lead to many "cells" with only one observation, and the fixed effects approach would effectively drop these observations from the sample.

Table 8: Transition Into Employment Controlling for Time-varying Effects of Occupation

	Men HS or less	Men Some Coll.	Men College+	Women HS or less	Women Some Coll.	Women College+
Black*Cr2	0.010	0.012	0.028	-0.006	-0.037	-0.027
	(0.017)	(0.030)	(0.045)	(0.014)	(0.018)	(0.027)
Hispanic*Cr2	-0.022	-0.042	0.023	-0.026	0.008	0.005
	(0.022)	(0.034)	(0.050)	(0.011)	(0.020)	(0.023)
AsianEast*Cr2	-0.065	0.003	0.033	-0.045	-0.068	-0.011
	(0.044)	(0.053)	(0.051)	(0.023)	(0.037)	(0.024)
AsianOther*Cr2	-0.226	0.059	0.045	-0.010	0.021	0.013
	(0.064)	(0.079)	(0.048)	(0.029)	(0.040)	(0.022)
Black*Cr3	0.013	-0.033	-0.020	-0.000	-0.000	0.036
	(0.018)	(0.032)	(0.041)	(0.014)	(0.020)	(0.026)
Hispanic*Cr3	-0.020	0.009	0.085	-0.016	-0.016	-0.002
	(0.023)	(0.042)	(0.049)	(0.012)	(0.021)	(0.025)
AsianEast*Cr3	0.029	0.068	0.004	-0.011	0.017	-0.001
	(0.045)	(0.068)	(0.048)	(0.028)	(0.042)	(0.026)
AsianOther*Cr3	-0.142	0.042	0.077	0.040	-0.118	-0.016
	(0.066)	(0.068)	(0.064)	(0.034)	(0.057)	(0.024)
Observations	52,476	26,976	24,118	72,926	46,894	51,916

4 Other Possible Explanations

4.1 Anti-Asian Sentiment

It is possible that the experience of Asian American workers during the pandemic reflects the impact of increased discrimination due to their perceived association with China. Such an explanation would be consistent with Kaushal, Kaestner, and Reimers (2007). That paper finds that earnings of Arab and Muslim men declined dramatically after the September 11th terrors' attack. It would also be consistent with the finding in Sakong (2018) that economic downturns are often associated with increased racial prejudice.

We take two approaches to investigating this. The first approach is to combine the CPS data with a state specific measure of anti-Asians bias, and see whether Asian Americans in states with larger bias were harder hit by the pandemic than those in states with less bias. The second approach is to investigate whether Asian American working in jobs that involve more intensive interpersonal interactions are harder hit than those in other occupations.

We construct a measure of racial bias using data from the Project Implicit Database.[10]

[10]https://implicit.harvard.edu/implicit/

Specifically, we use data from respondents of the "Asian Implicit Association Test" from 2004-2020 and construct a variable "implicit bias" as the average IAT score by month and state (see, e.g. Darling-Hammond, Michaels, Allen, Chae, Thomas, Nguyen, Mujahid, and Johnson (2020)). We then augment the specifications in Tables 7 and 8 by adding interactions between this bias variable and the pandemic-Asian interactions. In order to avoid potential reverse causality, we use the average values of the implicit bias in a state in 2018. When doing this, we find no evidence that Asian-Americans in states that had stronger anti-Asian bias in 2018 saw an especially large decline in employment during the pandemic.

Our second approach for detecting Anti-Asian sentiment is to look at whether Asian-Americans are especially negatively impacted in occupations that involve intensive interpersonal interactions. To do this, we combine the CPS data with the mapping from occupation to tasks developed by Aaronson and Phelan (2020).[11] Specifically, we use whether the variable "interpersonal task share" exceeds 0.5 (corresponding to the 75^{th} percentile). This includes, for example, the occupations "sales representatives, wholesale and manufacturing", "bartender", "host and hostesses, restaurant, lounge and coffee shops", and "real estate brokers and sales agents". On the other hand, the lower tail of "interpersonal task share" includes, for example, the occupations "industrial truck and tractor operators", "welding, soldering and brazing workers" and "electrical, electronic, electromechanical assemblers". The variable, interpersonal task share ("IP" in the table), is interacted with the indicator variables for being for being Asian American, as well as their interactions with the pandemic quarters.[12] These are used as additional explanatory variables in the regression in Table 7. The estimates are reported in Table 9. Only one of the estimated coefficients in Table 9 is negative and statistically significant at the 5 percent level. With 24 estimated parameters, this is not very different from what one might expect if all the parameter values are truly 0.

[11] Aaronson and Phelan (2020) in turn builds on Acemoglu and Autor (2011), who developed the measures from the O*NET database.

[12] Since the other ethnicity groups did not experience as dramatic a drop in employment at the onset of the pandemic, we did not attempt to decompose their decline into whether or not they were in an occupation with high level of interpersonal interactions.

Table 9: Job Characteristics

	Men HS or less	Men Some Coll.	Men College+	Women HS or less	Women Some Coll.	Women College+
AsianEast*IP*Cr2	-0.018	-0.130	-0.038	0.026	0.094	0.013
	(0.085)	(0.067)	(0.021)	(0.075)	(0.057)	(0.021)
AsianOther*IP*Cr2	-0.050	-0.008	0.017	-0.013	-0.123	-0.047
	(0.068)	(0.077)	(0.017)	(0.071)	(0.084)	(0.019)
AsianEast*IP*Cr3	-0.057	-0.089	0.026	-0.060	0.027	-0.019
	(0.078)	(0.063)	(0.017)	(0.061)	(0.036)	(0.017)
AsianOther*IP*Cr3	-0.097	-0.056	0.029	0.053	-0.029	-0.014
	(0.077)	(0.070)	(0.014)	(0.064)	(0.031)	(0.027)

4.2 Multi-generational Households

Another potential explanation for the differential downturn in employment across ethnicities is that some groups are more likely to live in multi-generational households. If people are concerned about the health of the older members and stop working during the pandemic as a result of this, then this might induce different patterns in employment across ethnicities. The results in Table 10 suggest that this is not the explanation for our findings. When we restrict the sample to individuals in households where there is no member older than 65 years, the estimates are very close to those in Table 7.

4.3 Country of Birth

One distinct feature of Asian Americans is that they are more likely to be foreign born than the other ethnicities. For example, 18% of the total sample is foreign born, while the fraction for Asian Americans is approximately 2/3. This suggests that the labor market differences between Asian Americans and Whites could be associated with language obstacles, other cultural differences associated with being foreign born, or discrimination against foreigners. In order to test this, we re-estimate the main model in Table 7 separately for the sample of individuals who are born in the United States and for sample of those who are not.

The results for the US born are presented in Table 11. It is striking that that all of the estimates related to Asian Americans interacted with the second quarter of 2020 are now statistically insignificant.

Table 12 presents the results for non-U.S. born individuals. The estimation uncertainty

Table 10: Estimation Excluding Individuals With Household Members Older Than 65

	Men HS or less	Men Some Coll.	Men College+	Women HS or less	Women Some Coll.	Women College+
Black*Cr2	-0.043	0.002	-0.045	-0.045	-0.008	-0.013
	(0.017)	(0.015)	(0.015)	(0.020)	(0.016)	(0.013)
Hispanic*Cr2	-0.012	-0.015	-0.013	0.007	-0.019	-0.016
	(0.012)	(0.015)	(0.012)	(0.018)	(0.016)	(0.015)
AsianEast*Cr2	-0.104	-0.065	-0.011	-0.077	-0.049	-0.019
	(0.044)	(0.037)	(0.014)	(0.042)	(0.039)	(0.014)
AsianOther*Cr2	-0.043	-0.087	-0.012	-0.031	-0.110	0.021
	(0.045)	(0.045)	(0.010)	(0.054)	(0.055)	(0.015)
Black*Cr3	-0.009	-0.001	-0.011	-0.039	-0.047	-0.018
	(0.014)	(0.016)	(0.013)	(0.018)	(0.016)	(0.012)
Hispanic*Cr3	-0.002	0.006	-0.009	0.014	0.009	-0.010
	(0.010)	(0.012)	(0.011)	(0.015)	(0.015)	(0.014)
AsianEast*Cr3	-0.010	-0.026	-0.017	-0.061	0.002	-0.023
	(0.023)	(0.031)	(0.012)	(0.034)	(0.028)	(0.013)
AsianOther*Cr3	0.013	0.030	0.004	0.040	0.071	-0.001
	(0.030)	(0.028)	(0.010)	(0.059)	(0.031)	(0.019)
Observations	110,295	82,332	131,911	70,353	78,161	136,530

Table 11: Estimation for U.S. Born

	Men HS or less	Men Some Coll.	Men College+	Women HS or less	Women Some Coll.	Women College+
Black*Cr2	-0.025	0.002	-0.038	-0.044	-0.010	-0.005
	(0.018)	(0.016)	(0.017)	(0.021)	(0.016)	(0.013)
Hispanic*Cr2	0.012	-0.009	0.016	0.013	-0.030	-0.001
	(0.017)	(0.018)	(0.014)	(0.023)	(0.019)	(0.017)
AsianEast*Cr2	-0.033	0.017	0.019	0.124	0.027	-0.024
	(0.086)	(0.061)	(0.023)	(0.099)	(0.063)	(0.026)
AsianOther*Cr2	-0.042	-0.038	-0.018	-0.120	-0.081	0.015
	(0.065)	(0.050)	(0.022)	(0.103)	(0.062)	(0.024)
Black*Cr3	-0.017	0.005	0.000	-0.030	-0.054	-0.018
	(0.015)	(0.016)	(0.015)	(0.019)	(0.017)	(0.012)
Hispanic*Cr3	-0.013	0.000	-0.019	-0.002	0.002	-0.023
	(0.016)	(0.014)	(0.014)	(0.021)	(0.017)	(0.018)
AsianEast*Cr3	0.037	0.063	0.005	-0.105	-0.089	-0.003
	(0.042)	(0.042)	(0.019)	(0.078)	(0.063)	(0.021)
AsianOther*Cr3	-0.038	-0.076	0.013	0.091	0.102	-0.002
	(0.062)	(0.059)	(0.015)	(0.097)	(0.043)	(0.033)
Observations	93,461	79,539	115,339	62,046	77,928	127,059

is much greater in this sample, but – as one might expect – the point estimates of the impact of the pandemic on Asian Americans are larger for this subgroup than for the full sample.

We conclude that the group that stands out is foreign born, low educated Asian Ameri-

cans.

Table 12: Estimation for Non-U.S. Born

	Men HS or less	Men Some Coll.	Men College+	Women HS or less	Women Some Coll.	Women College+
Black_Cr2	-0.077	-0.043	-0.058	-0.023	-0.004	-0.004
	(0.050)	(0.076)	(0.026)	(0.063)	(0.079)	(0.040)
Hispanic_Cr2	-0.036	0.057	-0.055	0.067	0.043	-0.040
	(0.029)	(0.060)	(0.025)	(0.052)	(0.060)	(0.034)
AsianEast_Cr2	-0.139	-0.036	-0.020	-0.109	-0.012	0.008
	(0.058)	(0.079)	(0.022)	(0.074)	(0.072)	(0.026)
AsianOther_Cr2	-0.050	-0.267	-0.014	-0.004	-0.093	0.041
	(0.059)	(0.102)	(0.016)	(0.081)	(0.107)	(0.029)
Black_Cr3	0.024	-0.038	-0.012	-0.020	0.021	0.003
	(0.038)	(0.057)	(0.028)	(0.049)	(0.056)	(0.038)
Hispanic_Cr3	0.034	-0.003	0.010	0.034	0.061	-0.002
	(0.024)	(0.033)	(0.023)	(0.042)	(0.052)	(0.029)
AsianEast_Cr3	0.028	-0.057	-0.020	0.009	0.074	-0.020
	(0.035)	(0.053)	(0.019)	(0.053)	(0.059)	(0.022)
AsianOther_Cr3	0.059	0.024	-0.016	0.115	0.152	-0.001
	(0.044)	(0.044)	(0.019)	(0.070)	(0.077)	(0.027)
Observations	27,539	9,505	24,014	17,834	8,949	21,516

5 The Role of Education

The analysis so far has been done separately for different education groups. One could argue that education is a choice made by an individual, and that this would make it endogenous. Table 13 shows the distribution of education by ethnicity for both genders in our sample. It is very clear that Asian Americans have higher education on average than other groups. In other words, the selection into education level potentially differs across the ethnicities. For example, the group of Asians Americans with a high school degree or less might be very different in terms of unobservables from other groups with the same level of education.

To investigate whether the results for ethnicity are biased by selection into different education groups, we estimate a model for the probability of working with the same explanatory variables as in Section 2, but now using the whole sample without conditioning on education groups. The first two columns of Table 14 show that Blacks, Hispanics and Asians all experienced a bigger impact of the crisis on their employment than Whites. The effects

Table 13: Distribution of Education (Aged 25-65)

	Men HS or less	Men Some Col.	Men College+	Women HS or less	Women Some Col.	Women College+
Whites	0.334	0.262	0.403	0.264	0.277	0.459
Blacks	0.458	0.285	0.257	0.369	0.315	0.316
Hispanic	0.601	0.214	0.185	0.533	0.237	0.230
Asians	0.224	0.160	0.616	0.232	0.158	0.610
Overall	0.390	0.251	0.359	0.321	0.268	0.410

are especially strong for East and South-East Asians who had the largest initial drops in employment for both men and women. This is consistent with the findings in Section 2.

Table 14: Results For the Whole Sample (Not Conditional on Education)

	All		Born In the US		Born Outside the US	
	Men	Women	Men	Women	Men	Women
Black_Cr2	-0.054	-0.036	-0.042	-0.033	-0.075	-0.039
	(0.011)	(0.011)	(0.013)	(0.011)	(0.028)	(0.030)
Hispanic_Cr2	-0.051	-0.042	-0.026	-0.019	-0.047	-0.083
	(0.009)	(0.010)	(0.013)	(0.014)	(0.019)	(0.021)
AsianEast_Cr2	-0.061	-0.060	0.029	0.027	-0.075	-0.104
	(0.017)	(0.016)	(0.031)	(0.033)	(0.025)	(0.025)
AsianOther_Cr2	-0.015	0.054	-0.037	0.026	0.018	0.044
	(0.016)	(0.020)	(0.028)	(0.034)	(0.024)	(0.029)
Black_Cr3	-0.046	-0.046	-0.049	-0.044	-0.045	-0.072
	(0.011)	(0.010)	(0.012)	(0.011)	(0.027)	(0.030)
Hispanic_Cr3	-0.029	-0.019	-0.044	-0.011	-0.027	-0.067
	(0.009)	(0.010)	(0.013)	(0.014)	(0.017)	(0.021)
AsianEast_Cr3	-0.005	-0.009	-0.013	0.083	-0.010	-0.081
	(0.016)	(0.016)	(0.031)	(0.030)	(0.023)	(0.024)
AsianOther_Cr3	0.009	0.010	0.014	-0.025	-0.001	-0.018
	(0.015)	(0.020)	(0.029)	(0.033)	(0.022)	(0.029)
Observations	656,346	706,004	546,034	584,391	110,312	121,613

6 Conclusion

This paper has documented that Asian Americans with no college education were especially hard hit by the onset of the pandemic. The negative effect on Asian Americans with no college education remains after controlling for differences in demographics, local labor market conditions, and job characteristics. The extra burden is primarily borne by individuals who were born outside the United States. The results add to the growing evidence that the

pandemic has had very different effects across different ethnicities. Here, we have studied employment. Whether the results generalize to other economic outcomes is an interesting topic for future research.

The paper illustrates the importance of treating Asian Americans as a distinct minority. Highly educated Asian Americans are similar to Whites in terms of labor market outcomes, but lower educated Asian Americans are more similar to other disadvantaged minority groups. This also highlights the vast heterogeneity within Asian Americans. Since Asian Americans is the fastest growing ethnic group in the United States, we expect these considerations to be even more important in future research.

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Appendix Tables

Appendix Table 1: Fraction of Men Aged 25 to 65 Working by Group in 2020-21

	Period	HS or less	Some Col.	College+	Overall
Whites	Jan-Mar, 2020	0.708	0.789	0.873	0.795
	Apr-Jun	0.621	0.699	0.819	0.723
	Jul-Sep	0.681	0.740	0.821	0.754
	Oct-Dec	0.684	0.742	0.857	0.769
	Jan-Mar, 2021	0.657	0.748	0.861	0.764
Blacks	Jan-Mar, 2020	0.578	0.735	0.858	0.697
	Apr-Jun	0.482	0.636	0.731	0.589
	Jul-Sep	0.543	0.666	0.757	0.631
	Oct-Dec	0.558	0.686	0.774	0.651
	Jan-Mar, 2021	0.545	0.676	0.804	0.651
Hispanics	Jan-Mar, 2020	0.800	0.828	0.893	0.823
	Apr-Jun	0.679	0.692	0.782	0.702
	Jul-Sep	0.736	0.766	0.796	0.755
	Oct-Dec	0.764	0.794	0.824	0.781
	Jan-Mar, 2021	0.752	0.746	0.850	0.769
Asians	Jan-Mar, 2020	0.768	0.763	0.871	0.832
	Apr-Jun	0.459	0.559	0.799	0.692
	Jul-Sep	0.631	0.712	0.838	0.774
	Oct-Dec	0.684	0.754	0.865	0.805
	Jan-Mar, 2021	0.681	0.722	0.864	0.802
All	Jan-Mar, 2020	0.715	0.786	0.873	0.790
	Apr-Jun	0.608	0.682	0.805	0.700
	Jul-Sep	0.671	0.732	0.815	0.740
	Oct-Dec	0.686	0.742	0.847	0.758
	Jan-Mar, 2021	0.666	0.736	0.855	0.753

*Statistics are calculated using population weights.

Appendix Table 2: Fraction of Women Aged 25 to 65 Working by Group in 2020-21

	Period	HS or less	Some Col.	College+	Overall
Whites	Jan-Mar, 2020	0.558	0.673	0.779	0.690
	Apr-Jun	0.445	0.571	0.687	0.593
	Jul-Sep	0.502	0.611	0.689	0.620
	Oct-Dec	0.527	0.649	0.757	0.667
	Jan-Mar, 2021	0.519	0.652	0.762	0.670
Blacks	Jan-Mar, 2020	0.558	0.679	0.784	0.669
	Apr-Jun	0.422	0.540	0.715	0.554
	Jul-Sep	0.450	0.588	0.736	0.585
	Oct-Dec	0.495	0.635	0.771	0.627
	Jan-Mar, 2021	0.486	0.628	0.770	0.625
Hispanics	Jan-Mar, 2020	0.526	0.698	0.765	0.619
	Apr-Jun	0.387	0.563	0.626	0.488
	Jul-Sep	0.465	0.587	0.668	0.547
	Oct-Dec	0.488	0.630	0.713	0.574
	Jan-Mar, 2021	0.472	0.629	0.724	0.565
Asians	Jan-Mar, 2020	0.556	0.647	0.671	0.641
	Apr-Jun	0.324	0.448	0.631	0.537
	Jul-Sep	0.459	0.570	0.635	0.587
	Oct-Dec	0.505	0.607	0.657	0.613
	Jan-Mar, 2021	0.521	0.604	0.687	0.635
All	Jan-Mar, 2020	0.549	0.676	0.765	0.672
	Apr-Jun	0.419	0.559	0.678	0.566
	Jul-Sep	0.481	0.601	0.686	0.600
	Oct-Dec	0.510	0.642	0.743	0.642
	Jan-Mar, 2021	0.501	0.642	0.751	0.644

*Statistics are calculated using population weights.

Appendix Table 3: Fraction of Men Aged 25 to 65 Working by Group in 2020-21 (Alt. Def. of Work)

	Period	HS or less	Some Col.	College+	Overall
Whites	Jan-Mar, 2020	0.729	0.812	0.892	0.816
	Apr-Jun	0.662	0.740	0.847	0.759
	Jul-Sep	0.709	0.772	0.857	0.787
	Oct-Dec	0.707	0.768	0.875	0.791
	Jan-Mar, 2021	0.684	0.775	0.877	0.786
Blacks	Jan-Mar, 2020	0.596	0.749	0.879	0.715
	Apr-Jun	0.526	0.678	0.774	0.632
	Jul-Sep	0.567	0.701	0.783	0.659
	Oct-Dec	0.574	0.711	0.801	0.672
	Jan-Mar, 2021	0.567	0.704	0.824	0.673
Hispanics	Jan-Mar, 2020	0.824	0.855	0.909	0.846
	Apr-Jun	0.720	0.737	0.816	0.743
	Jul-Sep	0.757	0.804	0.825	0.781
	Oct-Dec	0.782	0.822	0.842	0.801
	Jan-Mar, 2021	0.784	0.775	0.873	0.799
Asians	Jan-Mar, 2020	0.784	0.788	0.895	0.854
	Apr-Jun	0.561	0.625	0.840	0.750
	Jul-Sep	0.650	0.741	0.856	0.794
	Oct-Dec	0.701	0.776	0.881	0.822
	Jan-Mar, 2021	0.706	0.762	0.879	0.823
All	Jan-Mar, 2020	0.736	0.808	0.892	0.811
	Apr-Jun	0.652	0.725	0.837	0.739
	Jul-Sep	0.697	0.765	0.847	0.770
	Oct-Dec	0.707	0.768	0.866	0.780
	Jan-Mar, 2021	0.693	0.764	0.872	0.776

*Statistics are calculated using population weights.

Appendix Table 4: Fraction of Women Aged 25 to 65 Working by Group in 2020-21 (Alt. Def. of Work)

	Period	HS or less	Some Col.	College+	Overall
Whites	Jan-Mar, 2020	0.576	0.695	0.808	0.715
	Apr-Jun	0.487	0.619	0.735	0.640
	Jul-Sep	0.535	0.649	0.751	0.667
	Oct-Dec	0.550	0.677	0.782	0.692
	Jan-Mar, 2021	0.539	0.678	0.785	0.692
Blacks	Jan-Mar, 2020	0.582	0.707	0.806	0.693
	Apr-Jun	0.463	0.599	0.762	0.602
	Jul-Sep	0.484	0.640	0.787	0.630
	Oct-Dec	0.523	0.661	0.798	0.655
	Jan-Mar, 2021	0.506	0.663	0.795	0.651
Hispanics	Jan-Mar, 2020	0.543	0.720	0.792	0.639
	Apr-Jun	0.424	0.616	0.687	0.534
	Jul-Sep	0.490	0.623	0.727	0.584
	Oct-Dec	0.507	0.666	0.739	0.598
	Jan-Mar, 2021	0.493	0.658	0.746	0.589
Asians	Jan-Mar, 2020	0.575	0.676	0.704	0.670
	Apr-Jun	0.405	0.526	0.667	0.589
	Jul-Sep	0.482	0.599	0.669	0.618
	Oct-Dec	0.524	0.627	0.675	0.632
	Jan-Mar, 2021	0.538	0.627	0.704	0.652
All	Jan-Mar, 2020	0.568	0.700	0.794	0.696
	Apr-Jun	0.461	0.611	0.726	0.613
	Jul-Sep	0.511	0.641	0.743	0.645
	Oct-Dec	0.532	0.670	0.767	0.667
	Jan-Mar, 2021	0.521	0.670	0.773	0.666

*Statistics are calculated using population weights.

Appendix Table 5: Fraction of Men Remaining Employed by Group in 2020-21

	Period	HS or less	Some Col.	College+	Overall
Whites	Jan-Mar, 2020	0.951	0.960	0.967	0.960
	Apr-Jun	0.888	0.910	0.944	0.920
	Jul-Sep	0.945	0.948	0.956	0.950
	Oct-Dec	0.946	0.948	0.969	0.957
	Jan-Mar, 2021	0.941	0.954	0.974	0.960
Blacks	Jan-Mar, 2020	0.917	0.954	0.952	0.939
	Apr-Jun	0.815	0.871	0.892	0.857
	Jul-Sep	0.913	0.930	0.948	0.929
	Oct-Dec	0.934	0.939	0.954	0.942
	Jan-Mar, 2021	0.926	0.934	0.967	0.942
Hispanics	Jan-Mar, 2020	0.935	0.941	0.967	0.943
	Apr-Jun	0.870	0.877	0.931	0.885
	Jul-Sep	0.933	0.956	0.954	0.943
	Oct-Dec	0.933	0.947	0.961	0.941
	Jan-Mar, 2021	0.928	0.946	0.954	0.937
Asians	Jan-Mar, 2020	0.951	0.930	0.962	0.955
	Apr-Jun	0.700	0.801	0.934	0.883
	Jul-Sep	0.940	0.923	0.965	0.955
	Oct-Dec	0.940	0.942	0.974	0.963
	Jan-Mar, 2021	0.946	0.954	0.973	0.966
All	Jan-Mar, 2020	0.942	0.955	0.965	0.954
	Apr-Jun	0.868	0.896	0.937	0.905
	Jul-Sep	0.938	0.946	0.956	0.947
	Oct-Dec	0.941	0.946	0.968	0.953
	Jan-Mar, 2021	0.936	0.950	0.972	0.954

*Statistics are calculated using population weights.

Appendix Table 6: Fraction of Women Remaining Employed by Group in 2020-21

	Period	HS or less	Some Col.	College+	Overall
Whites	Jan-Mar, 2020	0.940	0.946	0.949	0.946
	Apr-Jun	0.841	0.874	0.906	0.885
	Jul-Sep	0.921	0.934	0.930	0.929
	Oct-Dec	0.933	0.944	0.961	0.951
	Jan-Mar, 2021	0.947	0.954	0.964	0.958
Blacks	Jan-Mar, 2020	0.909	0.925	0.953	0.931
	Apr-Jun	0.790	0.855	0.893	0.853
	Jul-Sep	0.895	0.891	0.933	0.910
	Oct-Dec	0.910	0.948	0.948	0.937
	Jan-Mar, 2021	0.922	0.931	0.958	0.939
Hispanics	Jan-Mar, 2020	0.918	0.937	0.933	0.927
	Apr-Jun	0.810	0.842	0.863	0.836
	Jul-Sep	0.909	0.924	0.909	0.913
	Oct-Dec	0.900	0.928	0.962	0.926
	Jan-Mar, 2021	0.908	0.936	0.941	0.925
Asians	Jan-Mar, 2020	0.926	0.917	0.937	0.932
	Apr-Jun	0.695	0.769	0.911	0.863
	Jul-Sep	0.888	0.943	0.941	0.933
	Oct-Dec	0.908	0.940	0.966	0.950
	Jan-Mar, 2021	0.948	0.940	0.970	0.961
3-8 All	Jan-Mar, 2020	0.928	0.940	0.947	0.940
	Apr-Jun	0.818	0.862	0.901	0.872
	Jul-Sep	0.912	0.926	0.930	0.925
	Oct-Dec	0.920	0.942	0.960	0.945
	Jan-Mar, 2021	0.933	0.947	0.962	0.951

*Statistics are calculated using population weights.

Appendix Table 7: Fraction of Men Entering Employment by Group in 2020-21

	Period	HS or less	Some Col.	College+	Overall
Whites	Jan-Mar, 2020	0.111	0.127	0.196	0.137
	Apr-Jun	0.151	0.189	0.195	0.174
	Jul-Sep	0.126	0.162	0.245	0.172
	Oct-Dec	0.116	0.141	0.184	0.141
	Jan-Mar, 2021	0.104	0.146	0.170	0.132
Blacks	Jan-Mar, 2020	0.075	0.142	0.233	0.111
	Apr-Jun	0.110	0.188	0.216	0.145
	Jul-Sep	0.114	0.149	0.182	0.134
	Oct-Dec	0.086	0.120	0.182	0.111
	Jan-Mar, 2021	0.089	0.149	0.238	0.128
Hispanics	Jan-Mar, 2020	0.213	0.209	0.319	0.224
	Apr-Jun	0.253	0.196	0.270	0.242
	Jul-Sep	0.194	0.253	0.275	0.221
	Oct-Dec	0.185	0.199	0.220	0.193
	Jan-Mar, 2021	0.239	0.172	0.213	0.221
Asians	Jan-Mar, 2020	0.150	0.179	0.278	0.220
	Apr-Jun	0.132	0.206	0.211	0.183
	Jul-Sep	0.151	0.197	0.249	0.206
	Oct-Dec	0.146	0.160	0.167	0.157
	Jan-Mar, 2021	0.134	0.190	0.197	0.172
All	Jan-Mar, 2020	0.123	0.141	0.219	0.149
	Apr-Jun	0.163	0.191	0.207	0.181
	Jul-Sep	0.138	0.174	0.242	0.176
	Oct-Dec	0.124	0.145	0.185	0.144
	Jan-Mar, 2021	0.128	0.152	0.186	0.147

*Statistics are calculated using population weights.

Appendix Table 8: Fraction of Women Entering Employment by Group in 2020-21

	Period	HS or less	Some Col.	College+	Overall
Whites	Jan-Mar, 2020	0.057	0.085	0.144	0.093
	Apr-Jun	0.089	0.129	0.133	0.116
	Jul-Sep	0.096	0.115	0.208	0.147
	Oct-Dec	0.069	0.110	0.126	0.100
	Jan-Mar, 2021	0.063	0.086	0.113	0.086
Blacks	Jan-Mar, 2020	0.086	0.119	0.161	0.112
	Apr-Jun	0.096	0.097	0.162	0.110
	Jul-Sep	0.102	0.145	0.221	0.141
	Oct-Dec	0.076	0.104	0.196	0.107
	Jan-Mar, 2021	0.063	0.122	0.127	0.095
Hispanics	Jan-Mar, 2020	0.072	0.094	0.176	0.090
	Apr-Jun	0.097	0.135	0.144	0.112
	Jul-Sep	0.111	0.138	0.210	0.137
	Oct-Dec	0.090	0.120	0.101	0.098
	Jan-Mar, 2021	0.084	0.125	0.142	0.100
Asians	Jan-Mar, 2020	0.073	0.123	0.111	0.102
	Apr-Jun	0.095	0.127	0.113	0.110
	Jul-Sep	0.144	0.124	0.126	0.131
	Oct-Dec	0.096	0.111	0.084	0.092
	Jan-Mar, 2021	0.085	0.103	0.091	0.091
All	Jan-Mar, 2020	0.067	0.093	0.143	0.096
	Apr-Jun	0.093	0.124	0.134	0.114
	Jul-Sep	0.104	0.124	0.199	0.143
	Oct-Dec	0.077	0.111	0.124	0.100
	Jan-Mar, 2021	0.070	0.099	0.114	0.091

*Statistics are calculated using population weights.