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POLICY BRIEF

21-9 Startups in the United States during the Pandemic Reflect Some Dynamism amid Job Losses

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INTRODUCTION

Millions of US workers are still looking for work. But an important and potentially hopeful sign of revival is emerging.

The number of new business applications in the United States shot up in the year since the start of the COVID-19 pandemic. The growth is driven largely by startups in online retail, transportation, and personal services. Many of these new entrepreneurs are self-employed and were likely laid off and forced into entrepreneurship by necessity. No official data are available yet on the number of businesses destroyed in 2020, because business data for firms that close without entering bankruptcy are lagging. But our calculations indicate that firm births may have surpassed firm deaths during the pandemic. While this boom in business entry is a tribute to the adaptability and potential innovative spirit in US capitalism, one should not be overly optimistic about jobs created in this wave of startups.

As many of these new startups are by people forced to strike out on their own, the number of jobs created per new firm is even smaller than it was during previous US recessions. And like online businesses started around the last recession (e.g., Uber, Airbnb, and Venmo), some of these new firms may turn out to be major contenders in their sectors, further displacing workers in existing firms.

In a turbulent era of success and failure of so many business enterprises, it is important to understand the role that startups play in contributing to economic growth. Research on new businesses has shown that young firms tend

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to grow faster than incumbents. High-growth firms that are made up largely of young firms account for about 50 percent of aggregate output growth and 60 percent of aggregate employment growth among all firms. And innovative entrepreneurship has another payoff: New firms increase competition, thereby increasing productivity and reducing prices for consumers.

This Policy Brief presents five facts about startup activity in the United States during the COVID-19 pandemic:

1. The number of new business applications in the United States increased by 24 percent in 2020. Growth continues in 2021, with business applications in the first quarter rising 62 percent over the same period in 2020, before the pandemic struck the United States.
2. US firm births are estimated to have surpassed firm deaths in the year between March 2020 and March 2021, unlike during the 2007–10 global financial crisis, when more firms closed down than opened up. The larger number of business startups this time did not lead to a net gain in employment, however.
3. The increase in business startups during the pandemic is attributed largely to entrepreneurship by necessity. The number of new business applications grew at a faster rate in 2020 in US states that experienced greater employment loss due to the pandemic, for example, Mississippi and Louisiana.
4. The largest increase in the number of new firms was in the online retail sector. Related sectors of transportation and personal services also experienced rapid rebounds.
5. Job creation per new firm is smaller than in previous crises, because activities are concentrated in sectors in which many new entrepreneurs are self-employed.

Together, these observations present a picture of a rapidly changing economy in which entrepreneurs sought to adapt to adversity and create new opportunities while many workers face challenges finding their place amid the sometimes abrupt transformations that occur in a modern society.

FACT 1: NEW BUSINESS APPLICATIONS IN THE UNITED STATES ROSE 24 PERCENT IN 2020 AND CONTINUED RISING

Growth continued in 2021, with business applications in the first quarter rising 62 percent over the same period last year. The increase in "high-propensity" business applications—applications that are very likely to turn into business with a payroll—reached a historical high of nearly 50 percent.

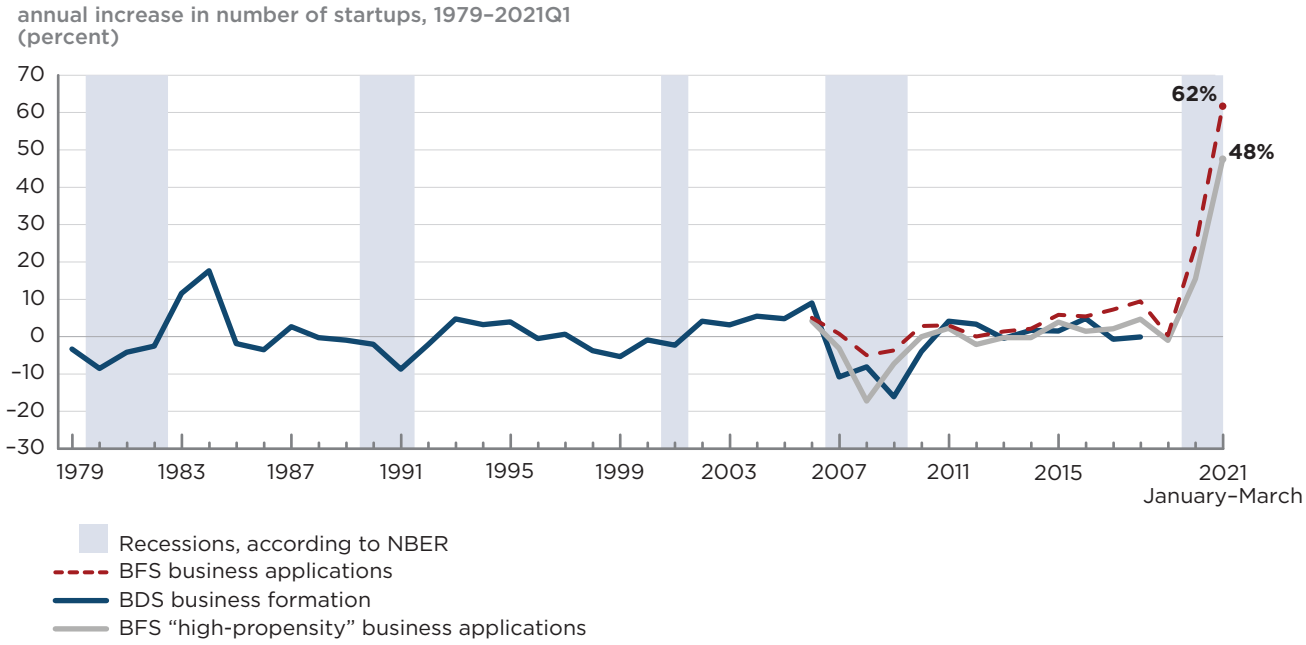
Some growth in startup activity was seen during previous US economic recessions. To document the patterns of new business entry, we employ two measures of firm births. The first measure is firm births from the US Census Bureau's Business Dynamics Statistics (BDS), which records the month that businesses start paying payroll taxes. These data are available only between 1978 and March 2018 at the time of writing, as verification of data takes time. The second measure is business applications from the US Census Bureau's Business Formation Statistics (BFS). These data are available monthly from 2004

through the present. This measure has been shown to be a leading indicator of subsequent business entry.[1]

Combining the two series, figure 1 shows that firm births typically accelerate toward the end of an economic crisis. This pattern was pronounced after the second oil shock (1984) and the recession of the early 1990s. Startup activities declined during the global financial crisis, starting to recover only in 2011. The pace of business formation bounce-back during the COVID-19 crisis is stronger and faster than in previous crises.

Figure 1

New business applications in the United States have surged since the start of the pandemic



BDS = US Census Bureau's Business Dynamics Statistics; BFS = US Census Bureau's Business Formation Statistics; NBER = National Bureau of Economic Research

Note: For the BDS series, a firm's birth year is the year an establishment belonging to the firm first reports positive employment in the week including March 12. It is a lagging indicator, as a firm that starts operations on, say, March 20 will appear as born only the following year. The business formation and dynamics data follow similar growth patterns in the years they overlap. The BDS firm birth data lag behind the BFS business application data. For 2021, annual growth rates are based on January to March business applications. Business applications are thus a leading indicator of subsequent business entry. NBER recession dates are matched to the years of peak to trough.

Source: US Census Bureau's Business Dynamics Statistics and Business Formation Statistics.

The scale of business entry in the United States during the pandemic lies in contrast to performance in other advanced economies. By the end of 2020Q3, business entry growth remained negative in several developed economies, including Hungary, Germany, Spain, and Portugal. Research written in the early

1 Business applications gathered by the BFS document new business formations as indicated by applications for an Employer Identification Number (EIN). EINs are identification numbers used by business entities for tax purposes. Firm birth data from BDS document firm births as indicated by the first report of positive employment based on payroll tax records.

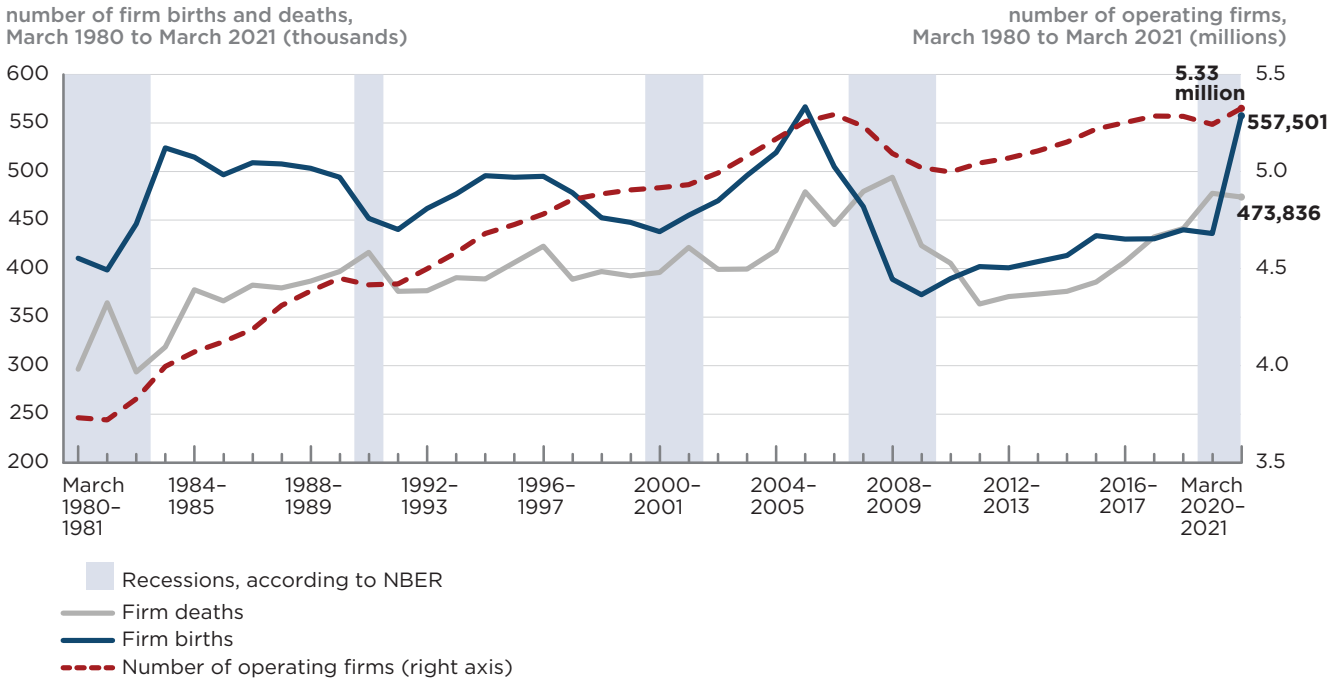
2020s (for example, Baker et al. 2020, Coibion et al. 2020, Sedláček and Sterk 2020, and Calvino et al. 2020) recorded steep declines in entrepreneurial activity in some advanced economies.

The correlation between unemployment and entrepreneurship dynamics in the United States may explain why the United States outpaced many EU countries in startup activities in 2020. European stimulus focused on keeping workers attached to their employers. US job retention schemes had a limited effect and failed to suppress employment declines in 2020. A 2020 PIIE Policy Brief that compares the US Paycheck Protection Program with French job retention packages finds that despite being much larger in size, the US scheme was less effective, because of implementation.

FACT 2: NET BUSINESS ENTRY BY EMPLOYER FIRMS MAY BE RISING, UNLIKE IN THE AFTERMATH OF THE 2007–10 FINANCIAL CRISIS

An estimated net entry of 83,665 firms (estimated 557,501 firm births minus 473,836 firm deaths) between March 2020 and March 2021 would raise the total number of operating US firms to a historical high of 5.33 million (figure 2).

Figure 2
US firm births are estimated to have surpassed firm deaths during the pandemic



NBER = National Bureau of Economic Research

Note: Firm deaths and births are for years beginning March 12 (in order to match the data timing of the US Census Bureau's Business Dynamic Statistics [BDS]). BDS data cover firms with paid employees. NBER recession dates are matched to the months of peak to trough.

Source: Data before April 2018 are from US Census Bureau's Business Dynamic Statistics (BDS). Data for March 2018–March 2021 are based on the authors' estimates.

Net business entry is the number of firm births minus the number of firm deaths. Firm deaths are difficult to measure contemporaneously, because official statistics are released with significant lags. For example, the BDS data on firm deaths in 2020 will be public only in 2023. We approximate firm deaths from March 2018 to March 2021 (matching the BDS time series) using the historical correlation between firm exit rates (using BDS firm deaths as a share of total firms) and the annual changes in the unemployment rate (March-over-March).[2] We estimate firm births after March 2018 using the annual growth of high-propensity business applications, matched to correspond with the BDS annual time series (March–March). In the estimation, we use Jason Furman and Wilson Powell's estimates of the "realistic unemployment rate" for March 2020 and 2021, which adjusts for a misclassification error and the unusually large withdrawal of millions of people from the workforce during the pandemic.

As a result of the global financial crisis of 2007–10, annual firm births declined from the precrisis peak of 567,000 in 2006 to 373,000 in 2010. On net, more than 170,000 firms died between March 2007 and March 2010. By 2018, more than a decade after the start of the last recession, the total number of operating firms in the United States had not yet recovered to its precrisis level of 5.29 million. The number of new firms this time around appears to be growing at a swifter rate than in the last recession.

FACT 3: THE INCREASE IN BUSINESS STARTUPS DURING THE PANDEMIC IS ATTRIBUTED LARGELY TO ENTREPRENEURSHIP BY NECESSITY—STARTING A BUSINESS BECAUSE OF LACK OF OPPORTUNITY IN THE JOB MARKET

This evidence is consistent with previous research that finds that during past downturns, higher local unemployment rates were correlated with increases in US entrepreneurship.

Limited opportunities in the wage sector incentivized entrepreneurship by necessity during the pandemic. In 2020, the South and Midwest had the strongest surge in startup activity, with growth of more than 30 percent in each region. Business applications in Mississippi, Georgia, and Louisiana saw the largest increases, rising by more than 50 percent. In two of these three states (Mississippi and Louisiana), unemployment rates were above 8 percent, higher than the national average of 7.4 percent, by the end of 2020. In contrast, business applications in South Dakota and North Dakota declined slightly in 2020. Unemployment rates in these states were just 3.5 and 4.7 percent, respectively, in 2020Q4 (below the national average).

We test the correlation between the boom in startups and job losses at the state level. The first measure for job losses is the log unemployment rate.[3] To

2 The estimation of firm exit rates is based on ordinary least squares regression of exit rates over the change in the unemployment rate over the period March 1978–March 2018. Crane et al. (2020) pioneer this estimation approach to examine the patterns of business closure in the United States; Greenwood et al. (2020) forecast business bankruptcy filings based on unemployment rates. The regression yields a coefficient of 0.31 for change in the unemployment rate, statistically significant at the 1 percent level. As a robustness check, we run the estimation with an additional dummy variable for the initial recession year. In this model, the coefficient on the change in the unemployment rate remains robust and positive, and the predicted firm deaths for March 2020–March 2021 are 22,000 higher than estimated by the univariate model.

3 This approach is in line with the analysis by Fritsch et al. (2013) of the correlation between German unemployment and entrepreneurial entry.

account for people who lost their jobs during the pandemic and dropped out of the labor force, we take the percentage change in annual average employment as the alternative job loss measure columns 1 and 2 in table 1 show that in a simple correlation, higher annual average unemployment rates or more severe job losses in 2020 are correlated with an increased probability of starting a business. The correlation with unemployment rate is statistically significant at the 10 percent level. A similar correlation was observed in Thailand and Germany during past crises.

Table 1
Regression results on correlation between severe job loss and increase in business applications in the United States in 2020

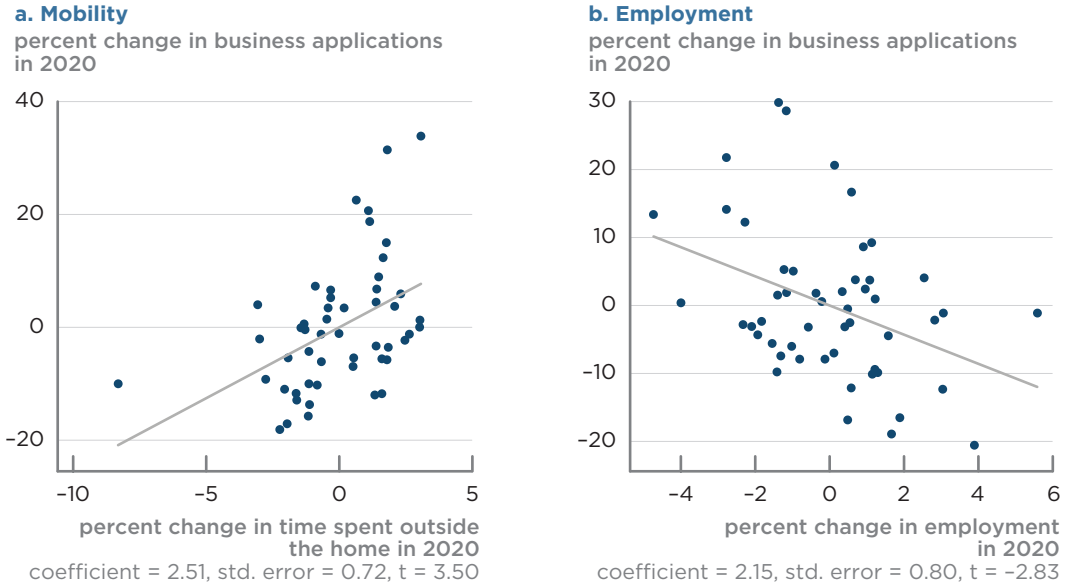
Dependent variable = 2020 business application growth rate				
Variable	***(1)***	***(2)***	***(3)***	***(4)***
Log unemployment rate (2020 average)	16.37* (8.905)		17.18** (8.298)	
Percent change in total employment in 2020		-0.697 (0.881)		-2.145*** (0.757)
Percent change in time spent outside home in 2020			2.125*** (0.72)	2.511*** (0.718)
Business application growth rate in 2019			1.578*** (0.245)	1.784*** (0.235)
Constant	-13.66 (17.66)	14.97*** (5.046)	10.3 (13.96)	37.42*** (5.9)
Observations	51	51	51	51
R-squared	0.064	0.013	0.53	0.562

Note: Standard errors are in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
Source: Business application data are from US Census Bureau's Business Formation Statistics (BFS); unemployment data are from the Bureau of Labor Statistics' Local Area Unemployment Statistics (LAUS); data on time spent outside the home are from Google COVID-19 Community Mobility Reports.

Columns 3 and 4 of table 1 have an added control variable for state entrepreneurship characteristics before the pandemic: the 2019 growth rate of business applications. Figure 3 shows the partial regression (added-variable) plots between 2020 application growth and the two estimators, change in employment and change in mobility, based on the regression model from column 4.

Another factor that distinguishes the 2020 recession from previous business cycles is that the damage to businesses was primarily from social distancing practices, including but not limited to state-imposed stay-at-home orders and closures of nonessential businesses. To account for the impact of lockdowns, we add measures of average daily mobility reduction in 2020 as another control variable. The results presented in figure 3 and table 1 (columns 3 and 4) reveal two facts.

Figure 3
Correlation between business application growth in a state and change in state's mobility and employment



Note: Figures show partial regression (or added-variable) plots of business application growth rate based on the multivariate regression from table 1, column 4.

Source: Authors' calculations based on data from Google COVID-19 Community Mobility Reports; Bureau of Labor Statistics Local Area Unemployment Statistics (LAUS); and business application data from US Census Bureau's Business Formation Statistics (BFS).

First, both the higher unemployment rate in 2020 (column 3) and the higher percentage loss of total employment (column 4) are correlated with a state's annual business application growth in 2020. The model using total employment losses gives a better fit than the one based on unemployment rate, suggesting that labor force dropouts add explanatory power to the model.

Second, controlling for employment factors, US states with larger reductions in mobility in 2020 (lower values for percentage change in time spent outside home) tended to experience smaller growth in business applications. This result indicates that, although internet-based startups such as online retailers drove the overall growth of business applications, the reduction of human interactions in a state is inversely associated with startup growth within the state.

One reason from the demand side for the correlation between startup activities and job losses may be the significant US government support for individuals. The 2020 Coronavirus Aid, Relief, and Economic Security Act (CARES Act) paid out $1,200 per eligible adult—much more than the $300–$600 per individual under the 2008 Economic Stimulus Act or the $300 in income tax rebates in 2001. The effects from the 2020 stimulus were also larger and faster than the effects of the stimulus programs in 2001 and 2008, with consumption of food and nondurable goods seeing the largest increases. US households responded rapidly to the stimulus, with spending increasing by $0.30 per dollar of stimulus during the first month. The Biden administration's stimulus package will have paid out another $422 billion to individuals by the end of 2021.

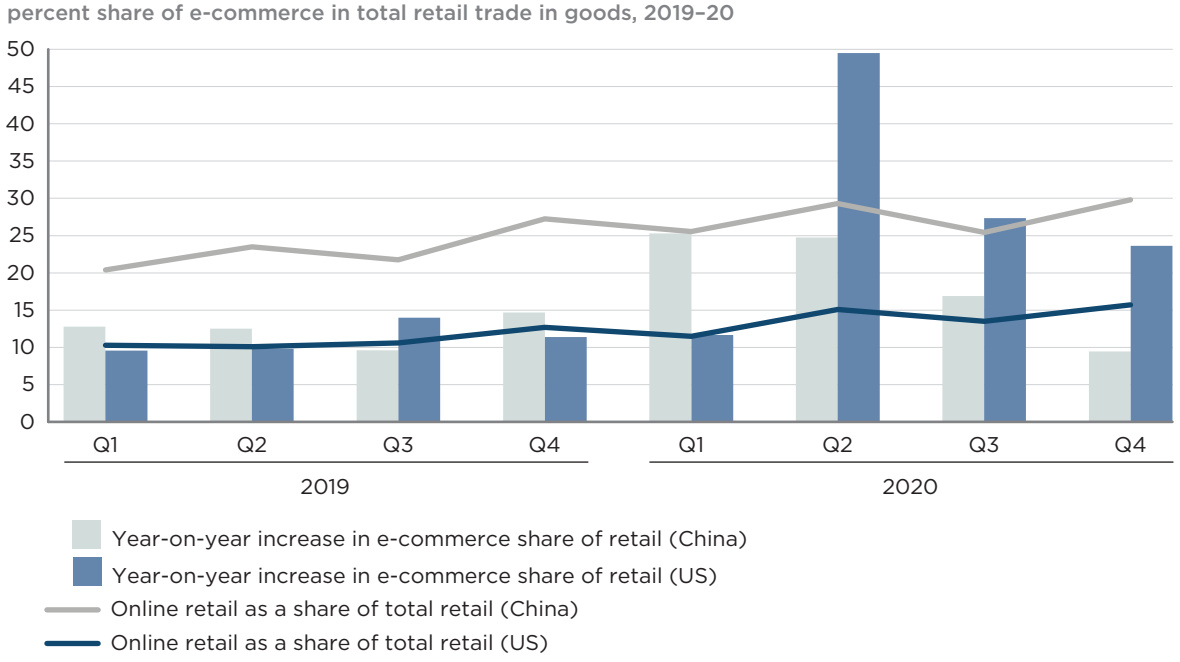
FACT 4: THE MAIN TREND IN BUSINESS STARTUP ACTIVITY DURING THE PANDEMIC HAS BEEN THE MOVE TO ONLINE SERVICES

In 2020Q3, quarterly business applications from the retail sector surged 127 percent year-over-year and accounted for one-fifth of all applications received. Within the retail sector, online shopping accounted for 70 percent of all applications in 2020.

The surge in e-commerce startups in the United States resembles the trend observed in China, where the number of newly registered firms rose by 12.8 percent in 2020. The largest increases in China were in food delivery–related services and live-streaming e-commerce. Alibaba, owner of China's largest e-commerce platforms, reported a 39 percent year-on-year increase in revenue from its domestic retail business in the fourth quarter. In the first two weeks of February 2020, nearly half a million offline retailers moved to Taobao, China's largest customer-to-customer online marketplace. Established US firms benefited from this trend, too: Amazon's online sales grew by 40 percent in 2020.

The sustainability of these new retailers and the associated job gains depend on the change in demand for online retail as the economy recovers. In China, the year-on-year growth rate of e-commerce as a share of retail declined in the second quarter, as lockdown measures were lifted (figure 4). During the same period, US online sales as a share of total retail trade rose by 50 percent, twice the rate in China. The pace of e-commerce expansion in the United States gradually slowed in the following quarters, as social distancing measures loosened up, mirroring the trend in China.

Figure 4
The surge in e-commerce startups in the United States resembles the trend observed in China



Note: Data are not seasonally adjusted.

Source: Data on US e-commerce are from the Census Bureau; data on China's retail sales of goods are from National Bureau of Statistics of China.

FACT 5: THE NET EFFECT OF JOB CREATION BY NEW FIRMS AND JOB LOSSES IN EXITING AND DISTRESSED FIRMS DURING THE PANDEMIC LEFT UP TO 10 MILLION WORKERS WITHOUT JOBS

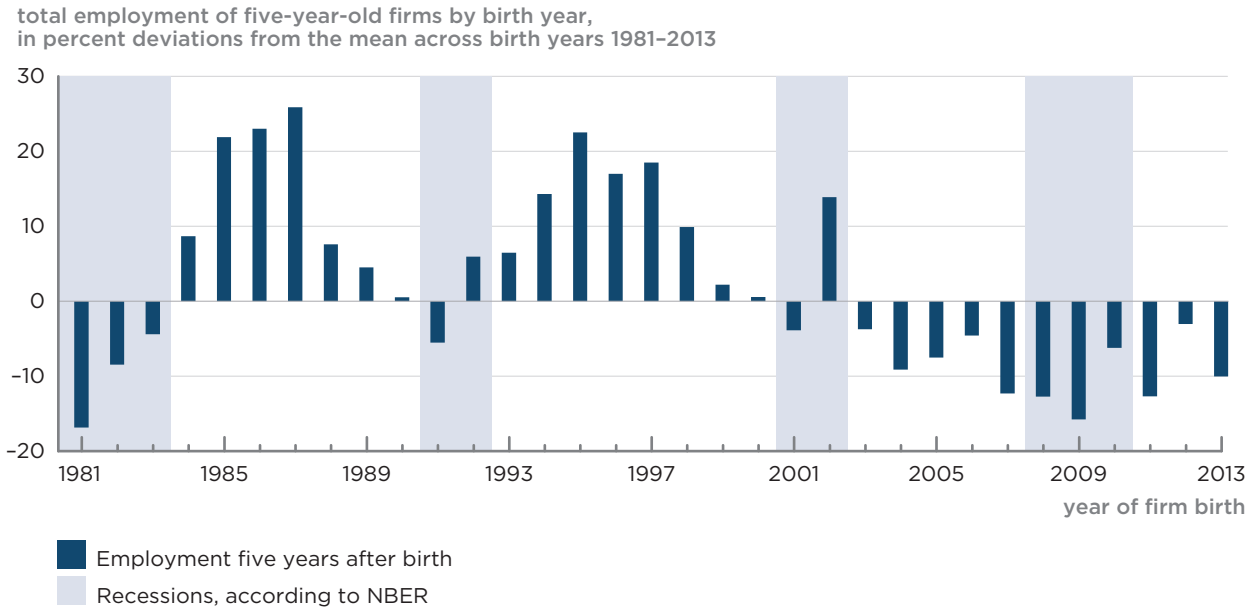
Our PIIE colleague Jason Furman estimates that total US nonfarm employment is currently 7 percent below its prepandemic trend, corresponding to 10 million jobs, and predicts that it would take to June 2022 to close the jobs gap. More workers are likely to be displaced as some startups become industry leaders and force existing firms to restructure their operations.

While business applications jumped in 2020, one should not be overly optimistic about the net job creation effects of this wave of startups, for three reasons. First, in the United States, employer firms born at the onset of recessions tend to start smaller than firms born in normal times, and firms that close eliminate more jobs per firm than the new firms create. BDS firm birth data for 1990–2018 show that new firms created 5.7 new jobs on average, but firm closures eliminated 6.2 jobs. Job creation during crises tends to be slightly weaker than usual, and job losses per exit tend to be greater. At the onset of past crises, annual job gains per entry dropped to 5.6 and job loss per exit increased to 6.6.

Second, firms born during recessions not only start smaller but also tend to stay smaller in future years. Following Sedláček and Sterk (2017)'s metrics, figure 5 shows that between 1981 and 2013, firms born during downturns still hired 5.4 percent less than the cross-cohorts mean after five years of operation (figure 5). The cyclicality of job creation does not go away as firms age.

Figure 5

Between 1981 and 2013, firms born during downturns hired 5.4 percent less than the mean after five years of operation



NBER = National Bureau of Economic Research

Note: Birth year covers the period between March 12 of *t*–1 to March of *t*, following the dating of BDS data.

Source: US Census Bureau's Business Dynamic Statistics (BDS); Sedláček and Sterk (2017, figure 1).

Startups born during the COVID-19 pandemic are likely to generate even fewer jobs than the historical crisis average of 5.6 per employer startup, because much of the 2020 growth was driven by the online retail sector and associated transportation startups, as well as personal service businesses, which often register as nonemployers. In recent precrisis years (2014–18), for example, only three new jobs were created per new employer firm in the online retail sector. Relative to 2019, nearly 30 percent more online startups in 2020, or more than 650,000 businesses, employed a single worker.

Besides online retail trade, the personal services sector—which includes personal care services, death care services, laundry and dry cleaning services, and a wide range of other personal services—and truck transportation were the main drivers of business application growth. These sectors grew by 52 and 27 percent, respectively, in 2020. Startups in both sectors are more likely than average to become sole proprietors or nonemployers. In 2018, personal service providers accounted for 8.5 percent of all nonemployer establishments or sole proprietors in the United States and just 3.3 percent of total employer firms.[4] For truck transportation, the sector made up 2.6 percent of nonemployer establishments and only 1.8 percent of firms with employees.

The COVID-19 crisis has reshaped the outlook for many sectors beyond retail. In just a few months, firms and workers invested in years' worth of digital transformation. This accelerated transformation is likely to result in less employment as well as significant churning among businesses in the months and years to come. Some online businesses that were established in the economic downturn of 2007–10—including Uber, Airbnb, Venmo, and Warby Parker—have become leaders in their sectors, displacing workers employed by their traditional rivals. This trend is likely to be accelerated with the arrival of new industry leaders born during the pandemic.

4 These results were calculated using US Census Bureau Nonemployer Statistics 2018. Nonemployer establishments in the agriculture sector were excluded, for comparability with BDS data.

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