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RESEARCH

A tale of two startups: the loss and gain of startups in the U.S. economy in the pandemic

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Abstract The COVID-19 pandemic delivered an unprecedented shock to business entry, with sharply contrasting effects on different types of startups. Using newly constructed administrative data from the Comprehensive Startup Panel covering the universe of U.S. startups, we provide the first official numbers of the pandemic's impact on employer and nonemployer startup dynamics. Nonemployer startup formation declined substantially in 2020, while the number of employer startups unexpectedly increased. In 2021, nonemployer formation rebounded, almost offsetting the 2020 decline. Survival outcomes also diverged: nonemployer startup survival dropped markedly during the pandemic, whereas employer startup survival remained largely stable. Within nonemployer startups, the contraction was broad-based, affecting nonemployers with and without an Employer Identification Number, an indicator of growth orientation. These findings reveal a pronounced compositional shift between employer and nonemployer startups and underscore the importance of designing policies tailored to nonemployer startups in economic crises.

Plain English Summary COVID-19 exposed a divide between employer and nonemployer startups in the United States. Using new administrative data that track every startup, we show that nonemployer formation fell sharply in 2020 as employer startups unexpectedly increased. In 2021, nonemployers rebounded and nearly offset the decline. Survival patterns diverged: nonemployers were less likely to survive, whereas employer startups remained largely stable. Within nonemployers, more formal, growth-oriented ventures were hit as much as side businesses. The takeaway is that headline figures centered on employer startups miss large and different movements among nonemployer startups. Policymakers and researchers should recognize the distinct needs of nonemployer entrepreneurs and ensure that measurement, training, and programs track and serve both types of startups to foster a resilient, inclusive recovery.

Keywords Entrepreneurship · Startup · Employer · Nonemployer · COVID-19 · Survival

JEL Classification L26 · E32 · M13

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1 Introduction

COVID-19 and the widescale policy response created the largest sudden disruption to health, work, education, and commerce possibly ever. Large losses to business activity, earnings, and sales have been documented in survey, industry, and state administrative data (Bartik et al., 2020a; Bohn et al., 2020; Crane et al., 2022; Desai & Looze, 2020; Fairlie, 2020; Fairlie & Fossen, 2022; Fairlie et al., 2023a; Farrell et al., 2020; Kim et al., 2020). Historically, macroeconomic crises have been associated with increases in business closures and declines in revenues, but impacts on new business formation are less clear (e.g., Fairlie, 2013; Parker, 2018; Perry, 2025). These patterns raised concerns that the pandemic could lead to a collapse in business activity. Early evidence confirmed a sharp contraction. In April 2020, the number of active business owners in the USA dropped by 22%—the largest decline on record (Fairlie, 2020). Business applications for new employer firms fell by 27% in the 5 weeks from mid-March to mid-April relative to the previous year (Wilmoth, 2020).

The full implications for business creation and startup survival, however, are not well known. Most early indicators—such as business applications and surveys—captured intent and short-run activity, but not the realized creation and survival of startups across the entire economy. In particular, a gap remains in understanding how the pandemic affected different types of startups. New businesses can take the form of employer startups (businesses that hire employees) or nonemployer startups (businesses without employees). Nonemployer firms account for roughly 89% of all startups in the USA (Fairlie et al., 2025), yet published statistics using the Longitudinal Business Database (LBD) or Business Dynamics Statistics (BDS) focus only on employer businesses and ignore nonemployer startups. Moreover, for employer startups, these statistics often misdate the true birth year because they do not account for a prior nonemployer phase.

Using newly created administrative panel data compiled from underlying U.S. Census Bureau business registry information, we provide the first official numbers on the impacts of COVID on startup formation and survival that include all business entities. The Comprehensive Startup Panel (CSP) covers the universe of startups in the U.S. economy and was only recently created to study startup job creation and survival from 1995 to 2018 (Fairlie et al., 2023b), and it has now been extended through 2021. Statistics on startup numbers and survival that include the universe of business entities tracked by the U.S. Census Bureau are not published. Instead, we generated these statistics using the restricted-access version of the CSP at UC Berkeley's Federal Statistical Research Data Center. During the pandemic, we find that the U.S. economy missed out on roughly 700,000 business startups without employees, and unexpectedly gained roughly 80,000 business startups with employees in the first year of the pandemic.

2 Methods

We analyzed startup numbers and survival rates based on the universe of business entities tracked by the U.S. Census Bureau using the Comprehensive Startup Panel (CSP), a novel restricted-access administrative dataset, which was developed by Fairlie et al. (2023b) and can be accessed at the Federal Statistical Research Data Centers. The CSP integrates two core U.S. Census Bureau sources: (i) the Longitudinal Business Database (LBD), which covers all non-farm employer establishments from 1976 onward, and (ii) the Integrated Longitudinal Business Database (ILBD), which covers nonemployer establishments (quinquennially from 1977 to 1992 and annually thereafter). The integration uses revenue activity to identify business births and provides harmonized measures of job creation and survival for all startups. A key innovation of the CSP is that it links the employer and nonemployer universes, allowing us to observe nonemployer startups and to capture the pre-employment years of employer startups. This linkage yields more accurate startup birth dating and enables each annual cohort to be followed longitudinally,[1]

We report formation and survival for employer and nonemployer startups. The CSP removes the concern that any changes in the number of employer startups in other datasets are partly capturing transitions from nonemployer businesses. The data on employer star-

[1] One limitation of the CSP is that it does not provide demographic information on startup owners. There might be interesting differences in who owns startups prior to the pandemic and post pandemic (see, for example, Cowling and Dvouletý 2023). Future research could link the CSP to the new Census NES-D, which includes demographic information on nonemployer business owners.

tups from the LBD refer to March of a given year, whereas the data on nonemployer startups from the ILBD are based on tax records for a given calendar year. Although cases of COVID in the USA had occured earlier, the social distancing restrictions that shut down many businesses did not start until the end of March 2020. Therefore, we refer to 2020 as before the pandemic for employers and as during the pandemic for nonemployers. Survival by cohort is measured as year-to-year survival rates from year t-1 to year t conditional on survival until year t-1.

Many nonemployer business entities are consulting, contracting or side-gig activities instead of more growth-oriented startups. To address the potential concern about overcounting the number of nonemployer startups, in additional analyses, we follow Fairlie et al. (2023b) and remove all nonemployers that do not have employer identification numbers (EINs) from the nonemployer counts. Nonemployers with EINs typically plan to hire or incorporate in the future, so this attribute can serve as an indicator of more formal and potentially growth-orientated startups.

Timing of pandemic policies

The novel coronavirus arrived in the USA in December 2019 and was starting to spread rapidly in the next few months. The governmental response to the disease was swift and included an effort to try to limit face-to-face interactions especially in crowded events or spaces, but the response mostly included voluntary or scattered recommendations or restrictions. But, these early attempts to slow the spread of the new disease were not enough. On March 16, 2020, the San Francisco Bay Area imposed the first social distancing restrictions that instructed residents to stay at home and not go to work, school, or stores if possible. By March 17, all states in the USA had reported COVID cases, and most were discussing whether to also implement shelter-in-place or social distancing restrictions. The states of California and New York soon followed the Bay Area by imposing state-wide shelter-in-place restrictions on March 19, 2020 and March 20, 2020, respectively. By April 5, 2020, almost all, if not all, states imposed at least some form of shelter-in-place or social distancing restriction or recommendations. The mandated shutdowns were expected to have negative impacts on many businesses.

The fears of consumers, owners, and workers over catching the contagious virus at stores, restaurants, offices, warehouses, plants, and anywhere else people interacted face-to-face were also a major concern in the beginning of the pandemic. Additional strategies to slow the spread of COVID beyond social distancing restrictions that might have impacted businesses included but are not limited to mask mandates, vaccine rollouts, vaccine mandates for certain occupations and enrollments, school closures, and remote learning.

3 Results

COVID led to both a major bust and boom in business formation in the country depending on the type of startup (Fig. 1). Total startups initially contracted during the pandemic, but the aggregate downturn masked a divergence between nonemployer and employer startups. The number of nonemployer startups plummeted by 693,000 from 5,021,000 in 2019, the year before the pandemic, to 4,328,000 in 2020, the first year of the pandemic. Using average growth rates in prior years, the expected number of nonemployer startups lost off prior trends is even larger at 855,000 (adjusted number). However, the decline did not last. The U.S. economy experienced a major rebound in nonemployer startups the following year. In 2021, this number increased by 627,000, which nearly wiped out all of the losses in the first year of the pandemic.

Next, we distinguish between nonemployer startups with and without EINs. We find that nonemployer startups with EINs decreased by 265,000, while those without EINs decreased by 428,000 in the first year of the pandemic (Fig. 2). Thus, even after excluding less growth-oriented nonemployers without EINs, there remains a substantial decline in nonemployer startup activity, highlighting that the pandemic also severely affected more formal and potentially growth-oriented nonemployer startups. By 2021, both EIN and non-EIN nonemployers rebounded, with those without EINs driving much of the resurgence.

In contrast, startups with employees experienced a surprising boom during the first year of the pan-

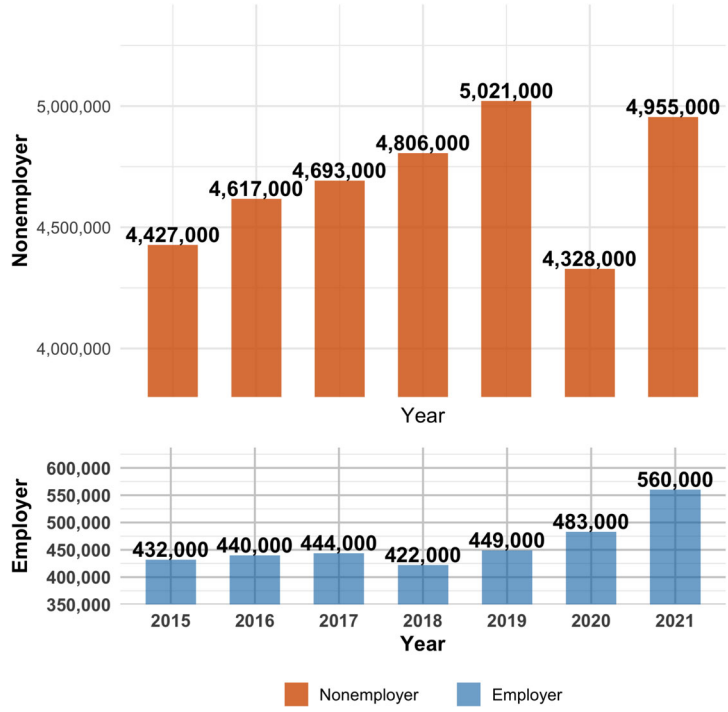


Fig. 1 Number of employer and nonemployer startups by year

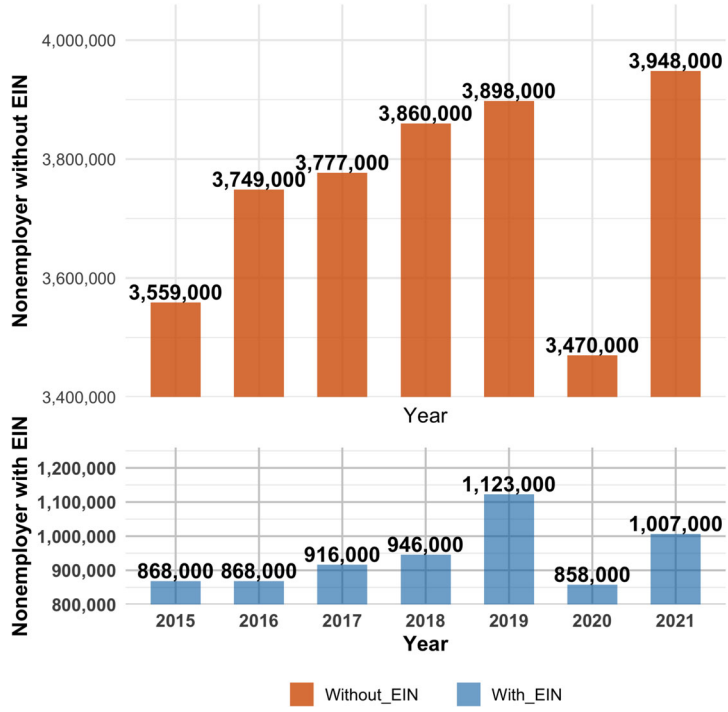


Fig. 2 Number of nonemployer startups with and without EINs by year

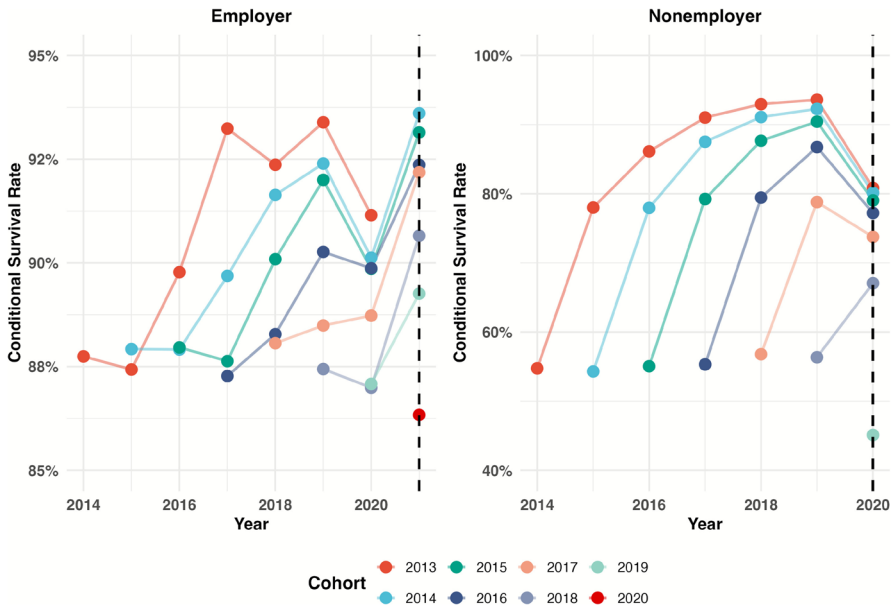


Fig. 3 Annual conditional survival rates by follow-up year and startup cohort: employer and nonemployer startups

demic.[2] As shown in Fig. 1, the number of employer startups increased by 77,000 from prior to the pandemic to roughly 1 year after the pandemic, as there were 483,000 employer startups in March 2020 growing to 560,000 employer startups in March 2021, representing a 16% increase. The projected gain in the number of employer startups adjusting for pre-trends is 100,032 (adjusted number). This surge is remarkable, as employer startup formation typically falls during severe economic contractions.

The pandemic also had a large impact on survival rates among new businesses started prior to the pandemic. Figure 3 shows conditional year-to-year survival rates by cohort. The U.S. economy lost many new nonemployer businesses due to COVID. Survival rates dropped precipitously for every startup cohort. For the cohort of nonemployer startups that began in 2019, only about 45% survived into 2020. By comparison, roughly 55% of nonemployer startups survived 1 year in pre-pandemic cohorts. For the 2018 startup cohort, the second-year conditional survival rate, which is through 2020, was 67% compared with an average second-year conditional survival rate of roughly 79% for previous cohorts before the pandemic. For all previous nonemployer startup cohorts, there is a clear drop in conditional survival rates in 2020 from pre-pandemic levels.

This overall pattern remains consistent when we separate survival rates for nonemployer startups with and without EINs (Fig. 4). While both groups experienced sharp declines during the pandemic, the survival rate dropped more significantly for nonemployers with EINs. The conditional survival rate averaged over the six youngest cohorts fell for nonemployer startups without EINs from 82% in 2019 to 77% in 2020. In comparison, the survival rate for nonemployer startups with EINs declined from an average of 87% in 2019 to 71% in 2020. This result highlights that even more formalized nonemployer businesses were substantially affected by the pandemic.

Employer startups exhibited more resilient survival patterns through the pandemic. COVID only reduced survival rates for the cohort starting just prior to the beginning of the pandemic; it did not reduce conditional survival rates across all cohorts (Fig. 3). The 2020 employer startup cohort had a 86% survival rate to 2021. All previous employer startup cohorts had a higher first-year survival rate averaging roughly 88%. Conditional survival rates from 2020 to 2021 for

[2] Early studies found large negative effects of COVID-19 on a wide range of business outcomes across a wide range of business scales and data sources. The data sources included the Current Population Survey, Business Formation Statistics, the Census Small Business Pulse Survey, the Alignable business network survey, the Facebook business survey, Homebase data, Google Places data, SafeGraph data, Yelp data, and Womply data (Alekseev et al., 2023; Bartik et al., 2020a, b; Bohn et al., 2020; Chetty et al., 2020; De Vaan et al., 2021; Fairlie, 2020; Kurmann et al., 2021; U.S. Census Bureau, 2020; Yelp, 2020).

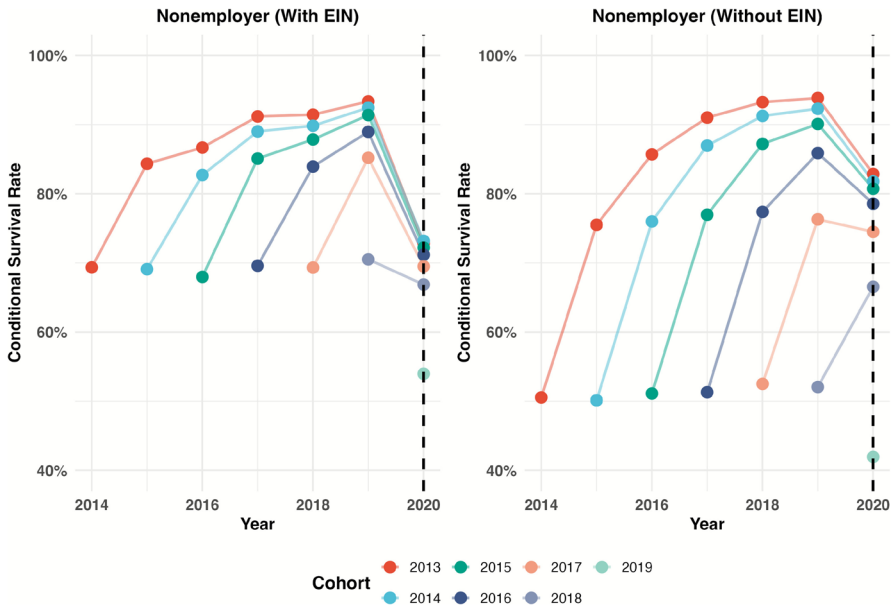


Fig. 4 Annual conditional survival rates by follow-up year and startup cohort: nonemployer startups (with vs. without EINs)

previous startup cohorts are on par with similar follow-up year survival rates prior to the pandemic.[3]

4 Conclusion

The importance of startups for economic growth, knowledge spillovers, and innovation is well documented (Audretsch et al., 2006; Baumol & Strom, 2007; Kerr & Robert-Nicoud, 2020; Reynolds, 2007). We find that there was a "tale of two startups" in which nonemployer startups were hammered by COVID, but employer startups were mostly unaffected. We document that the number of nonemployer startups dropped from 5,021,000 to 4,328,000 (a loss of 693,000 or 14%) in the first year of the pandemic but rebounded quickly. In the second year, the number of nonemployer startups increased by 627,000, nearly covering the previous year's losses. We also find that the initial loss and rebound show the same pattern when we focus on only more formal and potentially growth-oriented nonemployer startups. Survival rates also dropped sharply in the first year of the pandemic for all cohorts. For example, 55% of nonemployer startups typically survive through the following year, but only 45% of 2019 nonemployer startups made it through the following year.

In contrast, the number of startups with employees increased from 483,000 to 560,000 (an increase of 77,000 or 16%) in the first year of the pandemic.[4] Survival rates among businesses starting with employees just prior to the pandemic dropped slightly, but for all other cohorts of employer startups, the pandemic did not reduce survival rates. Although the causes of the divergence of patterns between nonemployer and employer startups in the pandemic are largely unknown and beyond the scope of this short descriptive paper, one potential cause requiring further study is the Paycheck Protection Program (PPP). The PPP, which was launched at the start of the pandemic, provided capital to retain employees. The first round of PPP funds was rushed out to small businesses with employees in April 2020, and funds were exhausted within 2 weeks (Mills, 2024; Rouse, 2024). The PPP likely reduced closure rates among new businesses with employees, but nonemployer startups did not qualify for PPP funds in the first year of the pandemic. By early 2021, however, changes were made to the PPP to include existing nonemployer businesses (U.S. Small Business Admin-

[3] The conditional survival rates of employer startups are slightly larger in the first than in the second year in most cohorts, consistent with the liability of adolescence, which emphasizes that newly founded organizations often have a stock of initial resources, helping them to survive initially until these resources are depleted (Fichman & Levinthal, 1991; Mahmood, 2000).

[4] This increase in the number of employer startups does not capture transitions from nonemployer startup to employer startup in the CSP as it would in the BDS and LBD data.

istration, 2025). Future research is needed on the difference by linking PPP loan receipt microdata to the CSP data used here. The analysis here also only scratches the surface, whereas the CSP offers the opportunity for more granular insights (e.g., sector-specific impacts, regional variations, or the role of policy interventions). Further research using the CSP could explore all of these areas.

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Author contributions All three authors contributed to the manuscript with the analysis and writing.

Data Availability The administrative data used for this research, the Comprehensive Startup Panel, is provided by the U.S. Census Bureau and available at Federal Statistical Research Data Centers. Interested authors can apply to the Census Bureau for access to the data.

Declarations

Ethics approval and consent to participate Not applicable.

Conflict of interest Frank Fossen thanks the Ewing Marion Kauffman Foundation for funding the research project "RG-202204-12283". We have no other declarations to make.

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