Surging Business Formation in the Pandemic: Causes and Consequences

By
Ryan Decker and John Haltiwanger*
November 2022

*Federal Reserve Board; University of Maryland and NBER. The analysis and conclusions set forth here are those of the authors and do not indicate concurrence by members of the Federal Reserve staff or the Board of Governors.
Growth has been resilient through October 2022. For HBA, avg monthly 2022 is about 30% higher than in 2019.

Note: Seasonally adjusted. All applications = BA series; likely employers = HBA series; likely nonemployers is residual. Shaded areas indicate NBER recession dates. Source: Census Bureau Business Formation Statistics.

Source: Tabulations from BFS.
Note: Startups within 8 quarters. Seasonally adjusted. Normalized by average 2006 levels. Shaded areas indicate NBER recession dates. Source: Census Bureau Business Formation Statistics.
Five 3-digit (NAICS) sectors account for 50% of Surge in Overall Applications

Source: Tabulations from the BFS.
Total applications: Dispersion in 3-digit sector net growth rates

Note: Standard deviation of annual growth rate of all applications at 3-digit NAICS level. Source: Census Bureau Business Formation Statistics.
Log Differences in Applications Per (1000) Capita Between Pre-Pandemic (2010-19) and Pandemic (2020-21).

Top counties increase by 52 log points up to 275 log points. Caution: All applications not just HBA.

Note: Difference of average (log) all applications per capita, 2020-2021 vs. 2010-2019. Source: Census Bureau Business Formation Statistics and population estimates.
“Donut” effects in cities? (Darker = more apps)

Log difference in applications, pandemic versus pre-pandemic.

- Similar patterns for Los Angeles, San Francisco, Atlanta
- Some regression evidence for “donut” relationship between density and applications
Open questions

What has been and will be the impact on firm, job and worker turnover?

• Have we observed a surge in actual firm and establishment births?
• Has there been sectoral and spatial reallocation of jobs and workers?

Focus here:

• Gold standard databases tracking firm, establishment, job, and worker turnover emerge with a lag. Now data through 2022:3 from JOLTS, through 2022:1 from BED and QCEW, and through 2021:3 for the QWI.
  • Establishment births and deaths at the aggregate level.
  • Establishment openings at 3-digit industry level.
  • Net establishment growth and excess separations at county level.
  • Job reallocation at detailed cell level (e.g., sector, location, firm age, firm size).
Note: High-propensity business applications. Seasonally adjusted. Y axes may not start at zero. Shaded areas indicate NBER recession dates.
Source: Business Employment Dynamics (BED) and Business Formation Statistics (BFS).
Note: Seasonally adjusted. Y axes may not start at zero. Shaded areas indicate NBER recession dates.
Source: Business Employment Dynamics (BED).
(Caution: Openings and not births. BED does not release 3-digit births)

Note: 2020:Q4-2021:Q4. Left panel expressed in average seasonally adjusted quarterly pace. Solid line is 45-degree line.
Source: Business Employment Dynamics (BED), Business Formation Statistics (BFS).
There has been rapid NET growth in establishments in the pandemic.

Note: DHS growth rate of total establishments, March versus year earlier. Source: BLS QCEW.
Growth is measured by log differences of measures between pandemic (2020-21) and pre-pandemic (2010-19).

Caution: Net establishment growth are for employer businesses and applications are all. Also recall lags from applications to startups.

Binscatter plot of log differences from county variation

Source: QCEW, BFS

Growth in Establishments Per Capita

Growth in Applications Per Capita

Slope = 0.0324, SE = 0.0045
Log Differences in Establishments Per Capita Between Pre-Pandemic (2010-19) and Pandemic (2020-21).

Patterns similar to Applications Per Capita around NYC

Some differences might reflect employer vs nonemployer Businesses (applications at county level are for all Applications, establishments at county level are for employer establishments)

Source: QCEW
Business formation surge part of broader increase in reallocation in pandemic. Still lower than 1990s.

Open question from one-quarter rates is how much of subsequent job creation is reversing job destruction within establishments.

Note: Seasonally adjusted. Reallocation is JC+JD. Shaded areas indicate NBER recession dates.
Source: Business Employment Dynamics (BED).
Reallocation Rate has increased. Difficult to interpret Within Cell (within-establishment reversals within cells). Between cell implies reallocation across groups – cannot be within-establishment reversals.

Between cell: If cell has no cumulative net change over 6-quarters it will not contribute to between cell. State*sector*firm age has differences in cumulative net growth rates across cells have seen largest increase.

Note: Averages of quarterly seasonally adjusted data through 2021q3. Sorted (descending) by change 2010-2019 to 2020-2021. Source: Census Bureau Quarterly Workforce Indicators (QWI) and author calculations.
Quits and Worker Churning Very Procyclical. Is there a connection between surge in applications and quits?

Excess separations” are conceptually and empirically closely related to quits.

Source: QWI, JOLTS, BED, BFS
Counties with surges in New Business Applications Have Also Seen a Surge in Excess Separations ("Quits")

Growth is measured by log differences of measures between pandemic (2020-21) and pre-pandemic (2010-19).

Source: QWI, BFS
Taking stock

• Striking surge in business applications during the pandemic, concentrated in industries oriented to changes in work and lifestyles induced by the pandemic
• Historically, a tight relationship between applications and business creation—both nonemployers and job creators
  • But with a lag
• Sectoral reallocation implied by dispersion of growth rate of applications across sectors
• Geography of business applications: outer rim of cities. Also movement away from major cities.
  • Highly nonlinear
• Has this surge in applications yielded surge in new businesses?
  • Surge in establishment births
  • Sectoral mix of establishment openings similar to sectoral mix of applications.
  • Surge in establishment formation in tandem with surging business applications, with roughly similar geography
• What about overall reallocation?
  • Surge in between-cell excess reallocation, particularly across state, sector and firm age categories.
  • Surge in quits and excess separations especially in locations with surge in applications.
Implications for the future?

• It will take some time for impact of this surge in new businesses to be understood (not just data lags):
  • Cohorts of new businesses highly volatile over first 10 years
  • Most fail, many don’t grow, small fraction grow rapidly

• Two views?
  • Innovative activity given surge in high-tech sectors like information processing, computer systems design.
    • Possibly taking advantage of and developing technology for remote work and changing lifestyles
  • Restructuring of activity to support new spatial allocation of activity given rise of remote work
    • Restaurants, gyms, service industries to support changing spatial allocation of daytime population

• Adding to uncertainty?
  • Contractionary monetary policy
  • Young businesses amongst the most vulnerable to contractions and deteriorating financial market conditions
Extra Slides
Use Davis et al. (2009) analysis to predict nonemployers along with NHBA.

Tight relationship: Correlation of 0.97.
In large CBSAs, highly nonlinear relationship between change in applications and population density

Dependent Variable: Change in (log) Applications Per Capita Pre Pandemic to Pandemic

Covariate:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log Pop Density</td>
<td>-1.719</td>
<td>0.364</td>
</tr>
<tr>
<td>Log Pop Dens Sq</td>
<td>0.156</td>
<td>0.034</td>
</tr>
<tr>
<td>Log Pop Dens Cu</td>
<td>-0.005</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Controlling for CBSA fixed effects

R-Squared 0.55 (within Rsq 0.13)

Spatial Model that incorporates characteristics of adjacent counties along with establishment density (estabs per sq mile)

Does Much Better

<table>
<thead>
<tr>
<th></th>
<th>Own county Direct Impact</th>
<th>Adjacent county Indirect Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\ln(\text{population density})$</td>
<td>-1.678**</td>
<td>-1.237**</td>
</tr>
<tr>
<td></td>
<td>(0.668)</td>
<td>(0.549)</td>
</tr>
<tr>
<td>$\ln(\text{population density})^2$</td>
<td>0.180***</td>
<td>0.163***</td>
</tr>
<tr>
<td></td>
<td>(0.064)</td>
<td>(0.053)</td>
</tr>
<tr>
<td>$\ln(\text{population density})^3$</td>
<td>-0.005**</td>
<td>-0.006***</td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>$\ln(\text{establishment density})$</td>
<td>0.100</td>
<td>1.10*</td>
</tr>
<tr>
<td></td>
<td>(0.351)</td>
<td>(0.620)</td>
</tr>
<tr>
<td>$\ln(\text{establishment density})^2$</td>
<td>-0.042</td>
<td>-0.150**</td>
</tr>
<tr>
<td></td>
<td>(0.038)</td>
<td>(0.066)</td>
</tr>
<tr>
<td>$\ln(\text{establishment density})^3$</td>
<td>-0.001</td>
<td>0.005**</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.002)</td>
</tr>
</tbody>
</table>

Notes: Estimated for CBSAs with Population > 1M. R-squared: 0.73

Densities measured in 2019. Observe estab density much more important for adjacent counties. Higher Rsquared comes mostly from adjacent county effects (not own county estab density).

Predicted pattern captures “donut” effect in cities like NYC.
Productivity Growth During the Pandemic

Annual Percent Change

Labor Productivity  TFP (utilization adjusted)