HOW IS COVID CHANGING THE GEOGRAPHY OF ENTREPRENEURSHIP? EVIDENCE
FROM THE STARTUP CARTOGRAPHY PROJECT

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<u>ABSTRACT</u>

Leveraging data from eight U.S. states from the Startup Cartography Project, this paper provides new insight into the changing nature and geography of entrepreneurship in the wake of the COVID pandemic. Consistent with other data sources, following an initial decline, the overall level of state-level business registrations not only rebounds but increases across all eight states. We focus here on the significant heterogeneity in this dynamic pattern of new firm formation across and within states. Specifically, there are significant differences in the dynamics of new business registrants across neighborhoods in terms of race and socioeconomic status. Areas including a higher proportion of Black residents, and more specifically higher median income Black neighborhoods, are associated with higher growth in startup formation rates between 2019 and 2020. Moreover, these dynamics are reflected in the passage of the major Federal relief packages. Even though legislation such as the CARES Act did not directly support new business formation, the passage and implementation of relief packages was followed by a relative increase in start-up formation rates, particularly in neighborhoods with higher median incomes and a higher proportion of Black residents.

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The Startup Cartography Project is available at https://www.startupcartography.com/home
A data appendix is available at http://www.nber.org/data-appendix/w28787

I.   Introduction

In the early months of 2020, the onset of the COVID-19 pandemic ushered in an unprecedented wave of economic lockdowns, as well as restrictions on movement, social interaction, and travel. The U.S. economy shrank swiftly and dramatically in response. Between February and April 2020, U.S. unemployment increased from 3.5 to 14.7 percent, the S&P 500 contracted by more than 34%, and second-quarter 2020 U.S. GDP dropped by more than 32% on an annualized basis (Bureau of Labor Statistics, 2020, 2021). The United States economy has improved significantly since this decline. Notwithstanding unprecedented fiscal policy to reactivate the economy, notably the CARES Act enacted in late March 2020 and the supplemental relief package in December 2020, both the level of economic activity and the level of overall employment remain below their pre-pandemic peaks as of March 2021 (Bureau of Labor Statistics, 2021).

While rising economic aggregates indicate an overall rebound in the U.S. economy, there is significant heterogeneity in the composition of gains made, including important differences across geography, race and socioeconomic status. Unemployment rates in New York, for example, followed starkly different patterns than those in Utah. By May 2020, the unemployment rate in New York City had soared to more than 20%, recovering to only 8.2% by the end of the year (New York Dept. of Labor, 2021). By contrast, Utah experienced only a short and modest increase in unemployment in May 2020 (peaking at just above 10%), and closed the year with historically low levels of unemployment (below 4%) (Utah Dept. of Workforce Services, 2021). Perhaps more saliently, the economic (and health) impact of the COVID pandemic has been realized very unevenly across different races, education and income levels. The black-white unemployment gap stood at 5.3 percentage points in June 2020, the widest it had been in 5 years. Employment gains in the U.S. recovery appear to be coming more slowly to Black adults. In the fourth quarter of 2020, the Black unemployment rate hovered at nearly double that of the white unemployment rate (9.9% vs. 5.8%), with the gap between them narrowing only by just over 1 percentage point (Bureau of Labor Statistics, 2021). The pandemic likewise had a more direct impact on the employment and incomes of low-income workers and neighborhoods. Multiple studies find that "low-wage workers in America have suffered the worst economic pain of the pandemic" (Kinder and Ross, 2020). Unemployment

rates in lower-wage industries like retail and hospitality/leisure were especially high (ranging from 17-39%). The least educated (those with less than a high school degree) confronted unemployment at more than twice the rate of college graduates. Accounting for these significant sources of variation is critical not only for understanding the ongoing impact of the pandemic but also for targeting effective policy responses to craft an inclusive recovery.

Entrepreneurship offers an important lens through which to view the response of individuals to the pandemic, and also serves as a potential economic channel to alleviate the COVID-induced recession. Founding a new enterprise, particularly amid an economic downturn and a high level of uncertainty, reflects both a choice and a capability on the part of an individual: a choice to seek an economic return and the ability to navigate an uncertain environment (Gans et al, 2021). Assessing the dynamics of business formation as well as the nature and geography of new firms founded can generate insight into the choices being made by individuals in response to an unprecedented contraction of the economy. Such an analysis can also reveal opportunities for catalyzing economic recovery. As a key foundation of economic dynamism, entrepreneurship can play a pivotal role in a region's economic recovery. Though the dynamics and drivers of the post-COVID economic recovery may be distinct relative to prior downturns, a wide body of evidence demonstrates that new firm formation and growth are the central drivers of net employment growth (Davis, Haltiwanger, and Schuh, 1996; Haltiwanger, Jarmin, and Miranda, 2013). Greater understanding of the nature of new businesses founded during the pandemic and the challenges these businesses face in terms of growth is vital for policymakers seeking to leverage entrepreneurship as a pathway for economic recovery.

A growing number of sources indicate that the dynamics and growth of entrepreneurship over the course of 2020 was distinctive relative to prior economic downturns as well as other top-level economic indicators. The U.S. Census Business Formation Statistics (BFS), the Current Population Survey (CPS), and the Startup Cartography Project (SCP) all identified a steep drop in new business formation at the onset of the pandemic (Fairlie, 2020; Buffington, et al 2020; Bartik et al 2020; Haltiwanger, 2021, Fazio, et al, 2020), with declines in new business registrations occurring much more rapidly and sharply and persisting for longer than those observed during the 2008 financial crisis or even in the aftermath of 9/11. Surprisingly, data from the BFS show applications for new IRS employer identification numbers (EIN) beginning

to increase starting in May 2020, pointing toward a rapid rise in new business formation (Buffington, et al, 2020; Dinlersoz, et al, 2021; Haltiwanger, 2021). As emphasized by Haltiwanger (2021), the BFS documents a striking increase in both employer-oriented and non-employer-oriented new EIN filings, with the rate of new filings actually increasing from an average of 300,000 per month in 2019 to more than 500,000 in July 2020, alone. "The increase from 2019 to 2020 in total application exceeds 20 percent which is double the rate in any other year." (Haltiwanger, 2021, p. 17).

The impact of the decline, recovery and acceleration in entrepreneurship in 2020 depends critically not only on the aggregate level of new business formation but also on the geography and nature of this entrepreneurship. For example, if the entrepreneurship increase observed in the BFS was centered in a small number of existing hubs of entrepreneurship or already prosperous economic areas, then the potential for this burst of entrepreneurship to attenuate the disparities that have arisen across geography, socioeconomic status and race during the pandemic is limited. Conversely, if the surge in startup formation is centered in communities that have experienced a higher rate of discrimination or a lower level of income, the potential of entrepreneurship to mitigate the larger economic contraction suffered there may be stronger. A better understanding of the nature and geography of the distinct pattern of new firm formation in 2020 may surface opportunities for community investment and help to reduce barriers that have historically contributed to inequality in entrepreneurship across race and socioeconomic status.

The purpose of this paper is to assess, in a preliminary way, the changing geography and nature of entrepreneurship in the wake of the pandemic and resulting policy responses. We focus, first and foremost, on the microgeography of the upswing in startup formation observed in the BFS and other data sources. We ask how the geography of entrepreneurship is changing within urban areas and investigate the relationship between entrepreneurship and differences across locations in terms of race and socioeconomic status. Next, we examine the link between the patterns observed and the passage and implementation of the two major economic relief packages in 2020 – the $2.3 trillion Coronavirus Aid, Relief and Economic Security (CARES) Act and the $900 billion Relief Supplemental Appropriations Act of 2021 (Supplemental)—on the geography of entrepreneurship. Together, these analyses provide a novel perspective on how

the economic impact of policy response to COVID-19 shaped the geography of U.S. entrepreneurship.

Our approach builds on the methodology and extends the dataset of the Startup Cartography Project (SCP; Andrews, et al, 2020). Based on Guzman and Stern (2015, 2017), the SCP combines state-level business registration records and a predictive analytics approach to provide measures of both the quantity and quality (i.e., potential for growth) of entrepreneurship over time and at an arbitrary level of geographic granularity. Specifically, while Andrews, et al (2020) report SCP results covering 49 states and Washington D.C. from 1988-2014, and 46 states through 2016, this paper draws on new data of the entire population of new business registration records in 2019 and 2020 for eight U.S. states comprising nearly 30% of GDP and population. Relative to the BFS (which relies on administrative data created in the context of applying for a Federal Tax Identification Number (or EIN)), state-level business registration is the administrative procedure in which a new organization is formed as a legal entity, providing protection from liability for the founders as well as the ability to divide equity and develop a corporate governance structure. Importantly, for each business registrant, we are able to observe the name of the business, its location, and the business registration type (e.g., partnership, LLC, or corporation).

We leverage these data to gain detailed insight into the changing geography and nature of entrepreneurship over the course of 2020 compared to 2019. First, consistent with the evidence from the BFS, we observe a dramatic decline in new business registrations between March and April, 2020, followed by a significant rebound and expansion in new business registrations compared to 2019. Overall, we find a more than 20% increase in new business registrations in 2020 compared to 2019. This overall increase masks significant heterogeneity across states in the rate of change of startup formation: while Georgia records a more than 57% increase, Washington State experiences only a 6% improvement over 2019. Second, improvements in the rate of entrepreneurship vary considerably across the microgeography of cities. In New York City, for example, Manhattan experienced a decline in entrepreneurship in 2020 relative to 2019, while the Bronx and Brooklyn register significant improvement. Third, this changing geography is associated with significant differences across neighborhoods in terms of race and socioeconomic status. Most notably, across a wide range of specifications and control structures,

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ZIP Codes including a higher proportion of Black residents, and in particular higher median income Black neighborhoods, are associated with higher growth in startup formation rates. Finally, while neither the CARES Act nor the Supplemental Act included specific provisions supporting new business formation, both are associated with an increase in new business registration with marked differences across geographies. After each, we observe an increase in the start-up formation rate, particularly in neighborhoods with a high median income and a high proportion of Black residents.

This granular assessment of the geography and nature of entrepreneurship provides an opportunity to gain sharper insight into changing drivers of the choice to establish a new business, the potential ways that entrepreneurship may serve as a source of dynamism, and the ways that policy might be targeted to best support the survival and growth of new enterprises for an inclusive economic recovery. Research has long documented the higher barriers faced by minority owned firms to securing the financial and human capital needed to survive and grow (e.g., Chatterji et al, 2011). Targeting support to these communities may be key to leveraging entrepreneurship as a catalyst for economic recovery.

II.   Entrepreneurship and the Geographic Demographic Divide

Entrepreneurship is simultaneously a choice by an individual or founding team to pursue an economic opportunity and a potential channel for economic development. Because the private incentives to become an entrepeneur (which depend on the private returns to entrepreneurship relative to the cost of establishing and growing a business) may be quite different than the social value of entrepreneurship (through the creation of new products and services, new jobs and other spillovers), gaps can arise between the privately chosen level of enterpreneurship and the socially optimal level of entrepeneurship.

This disjunction is important when considering the role of entrepreneurship in local econmic development, and in particular how barriers to entrepreneurship shape the resulting geography of entrepreneurship and the ways policies shape this response. On the one hand, as emphasized by careful studies of net employment growth across a wide variety of contexts, esssentially all net employment growth over the past forty years has been the result of the expansion of young firms as they have grown over time (Davis, Haltiwanger, and Schuh, 1996; Haltiwanger, Jarmin, and

Miranda, 2013). Moreover, this growth is highly skewed, with a very small fraction of all new establishments accounting for the entirety of employment and productivity growth (Decker, et al, 2014). But, almost by definition, the vast majority of the early growth of these young organizations occurs in the locations where they were initially founded, and thus specifically enhances opportunities for employment and productivity growth in that location (Feldman, 2001; Guzman, 2018). Put another way, the value of entrepeneurship in economic development falls disproportionately on communities and locations where such startup growth occurs (Moretti, 2012; Decker et al, 2016).

While the growth outcomes of entrepreneurship are of course not random and depend critically on the underlying entrepreneurial quality of a venture (Schoar, 2010; Hurst and Pugsley, 2011; Guzman and Stern, 2015; Andrews, et al, 2020),[1] strong entrepreneurial ecosystems that help firms establish themselves and scale are an important element of realizing the social value of entrepeneurship. For example, even outside the context of the COVID crisis, there are signficant differences across regions in the ability of a company of a given quality to grow. For example, firms in the Bay Area are more than 400% more likely to grow than a similar firm in an arbitrary location, and otherwise similar quality firms that move from an arbitrary location to Silicon Valley receive a 4.5X boost to their growth probability from that move (Guzman, 2018). One important consequence of the interplay between skewed growth outcomes and regional variation in the strength of entrepreneurial ecosystems is the emergence of a geographic economic divide: areas with strong entrepreneurial ecosystems are high-income, host "good jobs", and exhibit other markers of advantaged socioeconomic status (Moretti, 2012).

The promise of entrepreneurship as an engine of local economic development and social progress amplifies the impact of barriers to entrepreneurship, particularly for individuals from historically disadvantaged groups. Relative to the challenges of establishing and growing a business that a white male entrepreneur with financial and social capital typically faces, there is evidence that significant additional structural and systemic barriers obstruct both the founding

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[1] Indeed, a primary focus of the SCP is to integrate measures of the quantity of entrepreneurship with a predictive analytics model that also allows for the estimation of entrepreneurial quality (Andrews, et al, 2020). As emphasized in our work, the entrepreneurial quality distribution has historically been highly skewed (e.g., firms that register in Delaware and obtain or apply for a patent within six months of founding are more than 8,000 times more likely to realize a significant equity growth event than an average firm). However, given the impact of COVID on "Main Street" businesses, focusing not only on quality but also on the quantity of entrepreneurship is likely to be important in the context of the current crisis.

and the growing of new businesses by people of color and those from disadvantaged backgrounds. As summarized with careful detail and in a comprehensive literature review by Bates (2011), minority-led businesses confront barriers to growth well beyond those faced by their white counterparts. Most notably, potential Black entrepreneurs face less access to bank finance (Bostic and Lampani, 1999; Fairlie and Robb, 2007; Bates, 2011, 2018; Fairlie et al, 2020), and so found businesses with less initial capital, with more personal debt, and at a scale that limits their potential for growth and profitability. Moreover, racial discrimination in other markets (such as the housing collateral market) can amplify any patterns of discrimination in entrepreneurial finance (Atkins, 2020). These issues appear especially salient during the early stages of the COVID-19 pandemic. As documented by Fairlie (2021), in March through May of 2020, individuals of color experienced the largest decreases in relative firm formation.

While patterns of discrimination against minority entrepreneurs are significant and troubling in their own right, they have an important impact on the establishment and growth of entrepreneurship in terms of local economic development. Specifically, since entrepreneurship is a channel for economic opportunity, discrimination aginst minority entrepreneurs has the consequence of preventing communities with large minority populations from benefitting from the potential promise of entrepreneur-led economic development. Put another way, because discrimination against minority entrepreneurship lowers the returns to minority entrepreneurship, the impact of that discrimination includes not only the private loss to the entrepreneur but also the loss of social return to the community in which that entrepreneur lives.

Yet, in sharp contrast to the long existing inequities in access to startup capital for Black entrepreneurs, the period of 2020 saw two distinct areas of possible support for minority business owners. First, 2020 was a period of robust social action to support Black business owners and their communities. Precipitated by episodes of police brutality, the broad social movement of Black Lives Matter was an affirmation to the social and economic presence of Black communities across the United States, and created a social impetus where consumers and services directly focused —at least performatively—on providing access and support for Black entrepreneurs. Individuals sought to support Black owned businesses, and banks and other financial institutions emphasized their commitment to them and their communities. Further, at an individual level, the social affirmation from this movement could have resulted in increased self-

determination, higher locus of control, and willingness to undertake risk within these communities. Second, 2020 also included the $2.3 trillion Coronavirus Aid, Relief and Economic Security (CARES) Act and the $900 billion Relief Supplemental Appropriations Act of 2021 (Supplemental). While neither the CARES Act nor the Supplemental Act were specifically aimed at encouraging new business formation, both provided broad-based economic relief across demographic and geographic lines that were independent of historical inequities in access to entrepreneurial capital. All of these mechanisms and potentially others may be working against the persistent racial inequalities in entrepreneurship, changing the incidence and overall trend of Black entrepreneurship during the COVID recovery.

The confluence of the COVID-19 pandemic and social action in 2020 highlights the importance of understanding not only the overall aggregate impact of COVID on entrepreneurship, but equally importantly how the pandemic has shifted the geography and nature of entrepreneurship (particularly with respect to the rebound and overperformance in new business formation relative to 2019). On the one hand, it is possible that the interplay between lower economic impact (in terms of job loss) in higher-income and more white communities actually has exacerbated pre-existing inequality, with the potential that strong entrepreneurial communities are only getting stronger. On the other hand, it is possible that the combination of increased awareness and activism to address historical inequities, alongside the economic dislocations brought about by the pandemic, have provided new opportunities for minority communities to pursue entrepreneurship. While an early analysis of the impact of the pandemic, Fairlie (2021), finds that individuals of color experienced the largest decreases in relative firm formation at the onset of the pandemic, this analysis only covers the first few months of 2020 (and did not separately exame the period associated with the rebound and boom in entrepreneurhsip across the remainder of that year). Thus, to understand the impact of the pandemic and broader social movements on new firm formation, we need to consider both the overall level of entrepreneurship, as well as how, where, and under what conditions entrepreneurship is changing. It is essential to assess the changing demographic geography of entrepreneurship both to appreciate how individuals are responding to the pandemic and to design and target policy for an inclusive economic recovery.

III.   Data[2]

The Startup Cartography Project COVID Update

This paper extends the SCP dataset, which leverages state-level business registration records and predictive analytics to develop consistent metrics for the quantity, quality, and quantity-adjusted quality of entrepreneurship covering 49 states and Washington D.C. from 1988-2014, and 46 states through 2016, and made available at multiple levels of aggregation (see Andrews, et al, 2020). One advantage of the use of state-level business registration records is that these public records are created endogenously when an individual registers a new business as a corporation, LLC or partnership. While it is possible to found a new business without business registration (e.g., a sole proprietorship), the benefits of registration are substantial, and include limited liability, various tax benefits, the ability to issue and trade ownership shares, and credibility with potential customers. All corporations, partnerships, and limited liability companies must register with a Secretary of State (or Secretary of the Commonwealth) in order to take advantage of these benefits: the act of *registering* the firm triggers the legal creation of the company. As such, these records reflect the population of businesses for which an individual seeks to establish a formal organization separate from themselves in order to pursue some form of economic opportunity. Concretely, our analysis draws on the complete population of firms satisfying one of the following conditions: (a) a for-profit firm in the local jurisdiction or (b) a for-profit firm whose jurisdiction is in Delaware but whose principal office address is in the local state. In other words, our analysis excludes non-profit organizations as well as companies whose primary location is not in the state (e.g., companies that are founded in one state but then register in a second state as part of an expansion into that state-level market).

We gather data from eight U.S. states that make these business registration records available on a timely and cost-effective basis. Our dataset includes all registrations through February 2021 for Georgia, Kentucky, New York, Tennessee, Texas, Vermont, and Washington; and all registrations through the end of December 2020 for Florida. Each record includes the name of the company, the date of filing, the legal address for that company, the form of corporate

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[2] Some language in this sections draws on Andrews, et al (2020) (which itself draws on Guzman and Stern (2015, 2017). Please see Andrews, et al (2020) for a complete discussion (and more complete references) concerning the use of state-level business registration records, and the ability to link these records with other datasets, including firm-level growth outcomes.

governance, and in some states (or for particiular forms of organization) the names of the principal owners of the organization. The current analysis specifically leverages three elements of these data: the date of incorporation, the precise street address (including ZIP Code), and the form of corporate governance. It is useful to note the distinction between the three forms of corporate governance. On the one hand, LLC/Partnerships are the most straightforward form of corporate governance providing limited liability protection (in the case of an LLC) and tax advantages with a minimal level of ongoing administrative paperwork burden. Corporations on the other hand impose a more onerous administrative burden (and less tax flexibility). Finally, Local Delaware Corporations involve significant additional upfront expenses (requiring a separate registration in Delaware) but enable companies to take advantage of a more consistent body of corporate law governing Delaware corporations that is often preferred by external investors such as venture capitalists or investors in public stock offerings.

We limit our core analysis to business registrations in 2019 and 2020 across these eight states. The summary statistics are reported in Table 1A. We observe more than 2.8 million business registrations. 82% of these firms are limited liability companies or partnerships registered under local jurisdiction (*Local LLC or Partnership*), 16% of firms are corporations registered under local jurisdiction (*Local Corporations*), 1.4% of firms are local corporations registered under Delaware jurisdiction (*Delaware Corporations*) and 0.5% LLCs or partnerships under Delaware corporations (*Delaware LLC or Partnership*).

ZIP Code (ZCTA) Measures and Summary Statistics

After examining these data over time in aggregate and at the state level, the core of our analysis focuses on the changing geography of entrepreneurship in the wake of the COVID pandemic. To detect the geography of entrepreneurship in a granular fashion that nonetheless allows us to capture differences across locations in a consistent way, we focus our geographic analysis at the ZIP Code (ZCTA) level.[3] Specifically, for each of the 6734 ZCTA in our dataset,

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[3] Zip Code Tabulation Areas (ZCTA) are generalized area representations of USPS Zip Code service areas (United States Census, https://www.census.gov/programs-surveys/geography/guidance/geo-areas/zctas.html). While standard ZIP Codes represent geographic areas with well-defined geographical boundaries, ZIP Code boundaries potentially changed over time, and also there are ZIP Codes for PO Boxes, military, and large customers. To fix ZIP Code boundaries over time, we rely on the 2015 Zip Code to ZCTA crosswalk by the HRSA UDS mapper (https://www.udsmapper.org), which contains 41251 unique ZIP Codes, the correspondent ZCTAs, the type of ZIP Code, city and State. All but two ZIP Codes in the SCP were matched using the cross walk (which were then assigned manually).

we construct several core measures: *# Ventures 2019, # Ventures 2020,* and supplementary measures that only record the number of new business registrations from May 1 to December 31 in each year. The purpose of these latter measures is to capture the level of entrepreneurship registered within a ZCTA after the first wave of the pandemic and lockdowns. Overall, the average level at the ZCTA level for *# Ventures 2019* is 107, with an increase to an average of 145 in 2020. These ZCTA level measures are highly variable (the standard deviation in 2019 is 196 and 280 in 2020). We then calculate a measure, *Startup Growth Ratio,* which is simply the level of entrepreneurship within a given ZCTA in 2020 compared to the average level of entrepreneurship in that region across 2019 and 2020.

$$StartupGrowthRatio = (\frac{\#Ventures2020}{\frac{1}{2}(\#Ventures2019+\#Ventures2020)} - 1)*100 \qquad (1)$$

This measure captures the relative increase in the number of new business registrations in a given ZCTA. Overall, the average level of *Startup Growth Ratio* is 12 (with a standard deviation of 23) for a measure over the entire year, with an average level of 7 for the measure of increase that only accounts for the period between May and December of each year.

We then include a set of ZCTA characteristics, drawn from the 2017 American Community Survey (ACS) Demographic and Housing Estimates (which are themselves projections from the 2010 Census) to examine the relationship between entrepreneurship and various measures of the locational characteristics of these ZCTA. These measures include density (*Persons per square mile*), racial demographics (*Population, Proportion of People of Hispanic Origin, Proportion of People of Black Origin*) and socioeconomic differences (*Proportion of People with Bachelor's Degree or Higher, Proportion of People with Income Below Poverty Level, Median Income, Proportion of Owner Occupied Housing*, and *Proportion of Population Working Age*). Means and standard deviations for each of these measures are reported in Table 1B. We observe ample variation across ZIP Codes in these measures throughout our eight states. For example, the average proportion of non-Hispanic Black in our ZIP Codes is 9.4% (close to the national average), but the standard deviation of our measure is 16 percentage points. Similar patterns are observable, amongst others, for the proportion of Hispanics, with a mean of 14.5 and a standard

deviation of 20, and of the proportion with bachelor's degree, with a mean of 25 and a standard deviation of 17.

IV.   The Dynamics of State-Level Business Registrations: 2020 vs. 2019

Overall Trends

Our analysis begins in Figure 1A where we simply document the number of new business registrations in 2019 (dashed line) and 2020 (solid line) on a week-by-week basis.   There was a modest overall downward trend in new business registrations across 2019 (with occasional spikes for weeks that include holidays such as Thanksgiving). Prior to the pandemic, the week-by-week match in start-up formation through the first nine weeks of 2019 and 2020 is striking (ending Friday, March 6, 2020).   New business registration then takes a sharp downturn (relative to 2019) over the course of the next three weeks in 2020, with the new registrations falling to 57% of prior-year levels in the 11th week of 2020 (and ending Friday, March 27, 2020). There is then a steady rebound in new firm filings through the middle of May, after which point the rate of new business registrations in 2020 climbs to nearly 50% above that recorded in 2019. In the week ending July 1, 2020, new business registrations peak across the eight states we observe, with 37,008 new firms registered, the highest level of business registration recorded in a one-week span within these states.   Figure 1B illustrates the cumulative consequence of these weekly dynamics, recording the difference between 2020 and 2019 business registrations across the eight states in our dataset over time. While there is a sizeable decline during the onset of the pandemic (reaching a net drop of 32,360 new registrations by April 29), the cumulative difference in new business registrations across the two years turns positive on the week of June 24th, and then continues to climb through the close of 2020. Ultimately, across the 8 states, 2020 records 250,000 more new business registrants than those observed in 2019. This represents an improvement in 2020 of 21% over the 2019 baseline recorded. The striking patterns in Figure 1 are very different from the dynamics associated with prior economic and societal disruptions such as the period surrounding September 11, 2001 or the onset of the Great Recession in November, 2008 (see Fazio et al, 2020 for these graphs). In response to both of these prior crises, new business registrations declined by a much smaller magnitude and then returned to prior levels much more quickly. Moreover, the recovery in the rate of new firm

formation was not followed by any surge beyond prior year registrations, let alone the 21% increase we observe in the wake of the pandemic. (Fazio et al, 2020).

We next examine the link between these patterns and the passage and implementation of the $2.3 trillion Coronavirus Aid, Relief and Economic Security (CARES) Act and the $900 billion Relief Supplemental Appropriations Act of 2021 (Supplemental). As background, the CARES Act was signed into law on March 27, 2020, with $1200 relief checks being issued during the week of April 15, 2020. The Supplemental Act was signed into law on December 27, 2020, with smaller relief checks of $600 being issued during the week of December 30, 2020. Throughout our analysis, we examine patterns of new business formation relative to these key dates.

In Figure 1C, we include vertical lines that correspond to the date of the passage of the CARES Act and the date of check issuance, and then plot weekly new business registrations in the windows around these dates for 2019 and 2020. We see that passage and implementation of the CARES Act corresponds to the reversal of the downturn that began in the first week of March 2020. Moreover, the issuance of stimulus checks seems to be associated with a reinforcement of the rebound and presages a transition a few weeks later towards a sustained surge in new business registrations beyond 2019 levels. A similar pattern is observable in relation to the Supplemental Act in Figure 1D, where we see a pronounced increase in new business registrations corresponding almost exactly with passage of the Supplemental Act and issuance of the second round of stimulus checks.

The correlation between the two economic relief packages and the observed trends in new firm formation relative to 2019 is striking. While the largest economic relief acts in U.S. history, neither the CARES Act nor the Supplemental Act was specifically aimed at encouraging new business formation. Instead, the CARES and Supplemental Acts included a wide range of measures providing immediate relief to individuals and businesses, with targeted efforts towards buoying existing small businesses through lockdowns and reduced capacity restrictions. Specifically, the CARES and Supplemental Acts together supported a broad suite of relief measures, including $460 billion in economic impact payments (stimulus checks) directly to individual taxpayers, over $600 billion in forgivable small business loans for payroll, rent and utilities, $500 billion in loans and generous tax credits for corporations, significant extensions of unemployment benefits, rental assistance and moratoriums on evictions, and $340 billion in

support for state, local and tribal government. Essentially, these packages were meant to extend a "safety net" under existing businesses and individual employees, with the hope of slowing the tidal wave of closures and providing income security to individuals in the midst of mass layoffs and dramatically increased economic uncertainty. The patterns we observe seem to suggest that the two Acts achieved impact beyond the policy that they were designed to serve.

The overarching patterns evident across Figure 1C, for example, is consistent with the idea that this legislation had a ripple effect that worked not only to stabilize existing businesses but also to spark new business dynamism. Put another way, these broad patterns are in line with a simple (essentially Keynesian) economic model in which the CARES and Supplemental Acts both stimulated demand (and so led to more optimistic expectations about the economic future) and also reduced capital constraints on individuals (particularly those from lower-income backgrounds, where capital constraints are more likely binding).

Type of Corporate Form Associated with New Business Registrations.

We next examine the nature of this robust expansion in entrepreneurship by assessing the type of corporate form associated with 2020 new business registrations. Similar to Figure 1, Figure 2 records the week-by-week registrations of new businesses in each state, but divide them into three categories: LLC/Partnerships, Corporations, and Delaware Corporations. As discussed earlier, LLC/Partnerships are more likely to be local "Main Street" businesses, Corporations are more likely to be scalable local enterprises, and Local Delaware Corporations are the most likely to be associated with founding teams that have the ability to scale beyond the local market -- potentially through external investment. While Delaware Corporations maintain a level similar to 2019, both LLC/Partnerships and Corporations experience more dramatic initial declines followed by a rebound and period of expansion. Notably, new registrations for Corporations converge back to 2019 levels by early fall 2020. LLC/Partnerships, on the other hand, experience a more sustained boom over the remaining course of 2020. These "Main Street" registrations both drive the initial rebound in the spring and account for the bulk of the year-over-year expansion between 2019 and 2020.

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Differences Across States.

We build on these patterns by exploring differences across states in Figure 3A, examining cumulative net registrations in each state. Every state registers a decline during the onset of the pandemic, and every state also experiences a rebound and expansion so that their 2020 cumulative total is well above their 2019 totals. With that said, both the degree of the decline and the extent of the recovery varies considerably across states. For example, among the eight states we observe, New York suffers the most dramatic and immediate decline on a percentage basis, a finding consistent with the early widespread outbreak of COVID in the New York area in March, 2020. By contrast, both the decline and recovery in Vermont were much more modest (perhaps reflecting the lower impact of COVID on Vermont). Georgia, on the other hand, registers only a minor decline and then experiences a very significant and sustained expansion in new business registrations over the course of 2020: Georgia business registrations increase by 82,627, an improvement of more than 57%. Moreover, as seen in Figures 3B and 3C, while the magnitude of differences vary, the same overarching trends across time and distinct correlation between economic relief packages and increases in startup formation are evident across all seven states for which we have data. The relationship for the CARES Act is particularly notable since the change in trend after the Act holds across states with different levels of initial drop in entrepreneurship, different COVID infection rates, and different levels of local restrictions around this window.

These state-level findings hold three complementary implications. First, these data, drawn from state-level business registration records, are consistent with the broad patterns documented in the BFS, even though the BFS is itself calculated from a separate source of administrative data (i.e., Federal tax identification number applications rather than business registrations). Second, the overall similar pattern in the Startup Growth Ratio across these eight states (which themselves vary considerably in their population, density, political orientation and the like), suggests that the expansion in entrepreneurship is a fairly broad-based phenomenon that is not exclusively concentrated in one region or state. The pattern observed thus does not seem to be a response to a particular state-level program. Moreover, the fact that the rebound and expansion in the Startup Growth Ratio is led by new businesses organized as partnerships and LLCs (and not those registering in Delaware) suggests that this broad-based improvement in entrepreneurship reflects a higher number of new "Main Street" businesses rather than firms with

more national or global ambitions from the outset. Finally, despite similar overarching trends in the direction of change of the Startup Growth Ratio over the course of 2020, there are noticeable differences across states, both in terms of the depth of the decline and the extent of the expansion. Identifying the drivers of this variation is important both to better understand the factors fueling this upswing in entrepreneurship, and to enable effective targeting on the part of policymakers and other institutions nurturing the growth of new ventures. Accordingly, we now turn in a more granular way to the microgeography of the changing dynamics of entrepreneurship.

The Impact of COVID on the Microgeography of Entrepreneurship

To explore the impact of COVID on the microgeography of entrepreneurship, we draw on the ZCTA-level dataset including the rate of new business formation for 6,734 ZIP Codes in 2019 and 2020. Our analysis proceeds in two stages. First, we focus on a purely descriptive but informative analysis of the changing patterns of entrepreneurship within specific geographic regions (primarily individual cities). We then turn to a more systematic analysis of the impact of differences across ZCTAs in terms of race and socioeconomic status.

We begin with New York City. Figure 4A presents the overall pattern of business registrations in New York City.   As the first large metropolitan area in the United States hit by the pandemic, New York City's experience may have been exacerbated due to the high level of negative health outcomes (infection, hospitalization, and mortality), the high level of uncertainty, and the imposition of strict social and economic lockdowns. Relative to the broad patterns observed in Figure 1, the reduction in business registration at the onset of the pandemic is striking: there is a more than 67% decrease between the week of March 2 and the week of April 1, 2020. The recovery in business registrations is also impressive. The rate of business registrations over July, 2020 in New York City is 45% above the rate recorded in 2019.

Diving more deeply, we see that this overall pattern across New York City masks a surprising level of heterogeneity across different areas within it. As indicated in Figures 4B-4F, the Bronx experienced a persistent increase in new business registrations relative to 2019 for the remainder of the year. Brooklyn, Queens and Staten Island also experienced a sharp decline and rebound, but did not realize the same level of sustained improvement in entrepreneurship through the end of the year. In contrast to the outer boroughs, while the initial decline in 2020 new

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business registrations in Manhattan relative to 2019 was of a similar magnitude, and that area of the city then recovered to historical levels, there was no longstanding period during 2020 where Manhattan outperformed its 2019 record of business registrations.

These dynamics are captured even more vividly in Figures 5A and 5B, which document the value of the *Startup Growth Ratio* for each ZIP Code in New York City (Figure 5A) and the New York City metropolitan area (Figure 5B). For each ZIP Code-month, the color indicates the relative value *Startup Growth Ratio* (the relative change between 2019 and 2020 for that month and ZIP Code), with darker blues indicating a negative value, neutral colors indicating no change, and darker oranges indicating more positive increases.

While January is characterized by areas of improvement and decline (presumably due to random month-by-month variation), a sharp decline is experienced by nearly every ZIP Code across New York City during the month of April. A "summer recovery" then emerges in the Startup Growth Ratio that is concentrated in The Bronx, Harlem, and areas of southern Brooklyn such as Canarsie and neighborhoods in Eastern New York such as Jamaica. Perhaps not surprisingly, given the near-total decline in airline travel, the Startup Growth Ratio for the ZIP Code encompassing JFK Airport remains persistently in a strong negative position throughout the summer. However, relative to traditional patterns of business dynamism in New York (where Manhattan historically plays an especially important role), Manhattan lags in improvement, and Midtown and Lower Manhattan never experience a sustained period in new business registrations above their 2019 levels. This observed geographic variation is quite nuanced. For example, where South Harlem (a largely Black community) experiences a persistent boom after April, the adjacent Upper West Side (which has a much lower proportion of Black residents) never sees an improvement in new business registration relative to 2019. These nuanced trends are repeated when we expand our analysis to the entire New York City metro region. For example, while the entirety of Long Island experiences the sharp decline and rebound in new firm formation relative to 2019, the expansion appears concentrated more sharply in the more racially diverse southern suburbs of Long Island such as Brentwood and Central Islip rather than areas with less diverse populations such as Great Neck.

We extend this descriptive analysis in Figures 6A-F, where we examine these dynamics in more condensed form for key cities within our sample, including Atlanta, Houston, and southern

Florida. As indicated in Figures 6A and B, Atlanta experienced only a modest decline in business registrations in April (and there are indeed a mix of both positive and negative values for *Startup Growth Ratio* across ZIP Codes), followed by an almost uniformly positive increase in new business registrations by July 2020. This increase in the Startup Growth Ratio is much larger in ZIP Codes south of the center of Atlanta, including neighborhoods such as College Park and East Point. Overall, by the end of 2020, the Atlanta region records more than a 56% increase in new business registrations relative to 2019. The pattern in Houston (Figures 6C and D) captures some similar dynamics, where there is a more modest initial decline (relative to New York) and then a steady increase in the rate of new firm formation relative to 2019. In Houston, sharper increases in the Startup Growth Ration are concentrated in the outer rings of the metro area (potentially suggestive of the de-densification effects of the pandemic). Finally, while Southern Florida experiences a sharp decline in the Startup Growth Ratio in April (Figure 6F), the strength of its July increase is centered in the more diverse Miami region as opposed to areas with a more uniform white population such as Naples, Florida.

The Changing Demographic Geography of Entrepreneurship

These descriptive patterns (in conjunction with similar exercises for other cities and regions throughout our sample) surface the significant heterogeneity across regions that together comprise the overall increase in new business registrations documented across various data sources. Moreover, this descriptive evidence dispels perhaps the simplest hypothesis that might follow from the observed surge in U.S entrepreneurship in 2020 relative to 2019 – that increases in *Startup Growth Ratio* would be associated with traditional hubs of business dynamism in a region. As well, it highlights important characteristics of neighborhoods exhibiting the greatest increases in relative entrepreneurship. Many ZIP Codes experiencing the most rapid growth in entrepreneurship include areas with more diverse populations and a large historical Black or Hispanic population in particular. Motivated by these observations, we turn to a more systematic analysis relating the *Startup Growth Ratio* to zip-code level measures of demographic difference.

We begin in Table 2 and Figure 7 by examining a set of univariate correlations between a wide range of demographic characteristics and the *Startup Growth Ratio*. A number of observations stand out. First, though there has been an active debate over the degree to which the COVID pandemic would result in the reallocation of economic activity to less dense areas,

the coefficient on density (*Person per square mile*) is actually positive though insignificant. Second, and perhaps most strikingly, there is a quantitatively and statistically large univariate correlation between the *Proportion Non-Hispanic Black* in a ZIP Code and the *Startup Growth Ratio*. In contrast, the coefficient on *Proportion Hispanic Origin* is both an order of magnitude smaller in scale (despite having similar means and standard deviations) and statistically insignificant. Third, consistent with the potential of liquidity in entrepreneurship (particularly during an economic crisis), there is a significant and quantitatively large positive coefficient on *Ln(Median Income)*. Finally, there is a negative correlation on *Proportion Bachelor's Degree or Above*.

There are two potential challenges to the intriguing, yet unstructured, patterns documented in Table 2 and Figure 7. First, the demographic measures we examine are themselves correlated with each other. Accounting for the full set of demographic characteristics will provide sharper insight into the precise factors associated with the overall increase in the *Startup Growth Ratio*. Second, both the timing and severity of the pandemic varied considerably across the eight states within our sample, and these eight states vary considerably in terms of their underlying demographics. As such, it is important that we control not only for potentially confounding demographic characteristics but also more general variation across different regions included in our sample. We address these concerns by implementing a set of regressions that simultaneously include the full set of demographic measures drawn from the ACS as well as a full set of leading three-digit or leading four-digit ZCTA fixed effects. In other words, in the four-digit ZCTA fixed effect specifications, we are only leveraging variation within the nine adjacent ZIP Codes that share the same first four digits (e.g., 1178 would include ZIP Codes 11780 through 11789, all of which are in western Suffolk County, New York). Standard errors are clustered at the state level to account for potential spatial correlation in the error terms.

The main results are presented in Table 3. The first column reports regression coefficients for our specification, without including fixed effects. The patterns that we observe throughout our descriptive analysis are already apparent in this model. The coefficient for *Proportion Non-Hispanic Black* is positive and significant with a value of 0.32. Controlling for other characteristics, ZIP Codes with a ten percentage point higher proportion of non-Hispanic Black people saw a 3.2% higher increase in entrepreneurship. Similarly, a standard deviation increase

in this variable (15 percentage points) implies an increase of 4.8%, a value that is economically meaningful. A few other variables are also statistically significant, but with a coefficient that is an order of magnitude smaller relative to its standard deviation. We proceed to incorporate our regional controls in columns (2) and (3), by also including the 3-digit and 4-digit ZIP Code fixed effects, respectively. Our results appear quite consistent, leading to the same conclusions. Using column (3) as our most stringent specification, the coefficient for *Proportion Non-Hispanic Black* is attenuated slightly to 0.23. All other coefficients have smaller magnitudes and are not statistically significant. These results highlight the importance of the presence of a Black population in predicting regional entrepreneurship response at a microgeographic level.

In Column (4), we develop this result further by considering only the recovery phase from COVID—rather than the whole year—and excluding from our dependent variable the months of January to April, where most of the (heterogeneous) initial negative impact is concentrated. Our coefficient for non-Hispanic Black is slightly higher and more precise, with a value of 0.32. More importantly, we now observe more precision in several other variables that may also be correlated with COVID response, even if at lower magnitudes. *Proportion Hispanic Origin* has a statistically significant magnitude of 0.07, implying an increase of 10 percentage points in this variable increases post pandemic entrepreneurship by 0.7%. Interestingly, and in contrast to the common correlations in the literature, the relationship of education (*Proportion with Bachelor's Degree or Above*) is negative and significant, as is *Proportion of Working Age Population,* though the coefficients for both are relatively small. Understanding the extent to which these additional variables also predict COVID response, besides the presence of non-Hispanic Black and income, is one avenue for our future work.

We then study in columns (5) and (6) the way in which these two variables interact to consider whether it is Black neighborhoods with the higher or lower income ZIP Codes that experienced the rise we observe in entrepreneurship. We de-mean our independent variables to allow the main effect of our regression to be estimated at the mean. The interaction for each is positive and significant, with coefficients of 0.06 for column (5) and 0.07 for column (6). This implies that for each one log-point increase in the median income, the relationship between total entrepreneurship increase and proportion of Black population strengthens by 0.06 points. That is, it is the Black high income neighborhoods where the response was most substantial.

Finally, we present in Appendix Table A1 a series of robustness tests for our results. Column (1) replicates our main specification using the total count of firms in 2020 minus 2019 as the dependent variable. The coefficient of 2.88 for *Proportion of Non-Hispanic Black* is significant. It implies an average increase of 2.88 firms for each percentage point increase in the share of non-Hispanic Black people in a ZIP Code. Given a mean of this variable of 41, and standard deviation of 117, this effect is economically meaningful. Columns (2) and (3) are regressions that put directly the log of firms in 2020 as the dependent variable. Column (2) includes the log number of 2019 firms as a control, while column (3) is the log difference between 2020 and 2019 as the dependent variable. The impact of *Log(Proportion of Non-Hispanic Black)* is positive and significant. The coefficient suggests doubling the proportion of non-Hispanic Black people leads to a 4.8% increase in the total number of firms in 2020. Column (4) considers only ZIP Codes that have at least 10 firms in 2019 to avoid small sample issues, and column (5) includes fixed-effects for CBSA rather than 3-digit ZIP Codes. The results are qualitatively and quantitatively the same as our main effect in Table 3.

Together, our results document a series of important relationships in the incidence of new firm formation during the COVID pandemic. Three key results stand out. First, while the overall level of new business registrations increases across all eight states, there is significant heterogeneity across states. Whereas Georgia records a 57% increase in startup formation relative to 2019, Washington State experiences only a 6% improvement. Second, improvements in the rate of entrepreneurship vary considerably across the microgeography of cities. In New York City, while Manhattan experienced a decline in entrepreneurship relative to 2019, the Bronx and Brooklyn register significant improvement. Finally, this varied geography of the rebound in new firm formation is associated with significant differences across neighborhoods in terms of race and socioeconomic status. Most notably, across a wide range of specifications and control structures, ZIP Codes including a higher proportion of Black residents, higher median incomes, and higher median income Black neighborhoods are associated with higher growth in startup formation rates.

The Relationship between Economic Relief Packages and the Changing Demography of Entrepreneurship

We next undertake more detailed regression analysis of the relationship between the CARES and Supplemental Acts and the dynamics of the geography of entrepreneurship. We begin by constructing a dataset of new business starts at the ZIP Code (ZCTA) level on a weekly basis for 2019 and 2020 from seven states (Georgia, Kentucky, New York, Tennessee, Texas, Vermont and Washington). We then regress the number of new business registrations (the "Startup Formation Rate" or SFR (Andrews, et al, 2020)) on an OLS regression including week fixed effects, year fixed effects, ZIP Code fixed effects, and Federal holiday fixed effects. Standard errors are clustered at the state level. We calculate the week-by-week coefficients corresponding to the weeks just before and after the passage of CARES and Supplemental Acts (setting the baseline at five weeks prior to the passage of each policy). We complete this analysis both in levels and in log plus 1 (to gauge relative effects) first for the CARES Act (Figures 8 and 9), and then for the Supplemental Act (Figures 10 and 11).

Figures 8A and 9A plot the coefficients of this regression. Consistent with the earlier aggregate analysis, we observe a meaningful drop in total entrepreneurship during COVID that is then reversed after the passage of the act, helping to stabilize this segment of the economy. The level of new business formation falls more than 40% in the four weeks prior to passage of the CARES Act. The overall rate of new business formation rebounds to nearly 2019 levels within two weeks of the issuance of relief checks in mid-April.

We go on to examine the relationship between the CARES Act and the geographic demography of entrepreneurship. Specifically, in Figures 8B and 9B, we report the week-by-week coefficients of our model run only on the subsample of ZIP Codes with the highest and lowest percentage of Black residents (those in the top and bottom 25% of the distribution). We observe three key interrelated findings. First, the Startup Formation Rate declined more precipitously prior to the passage of the CARES Act in predominantly Black neighborhoods. Second, passage of the CARES Act is linked to a reversal and rebound in both Black and non-Black neighborhoods. Third, and notably, however, in the period subsequent to the issuance of checks, a rebound and surge in entrepreneurship is seen in Black neighborhoods, but not non-Black neighborhoods. And, the increase in SFR in Black neighborhoods persists for the

remainder of 2020). Within 12 weeks after the CARES Act, predominantly Black neighborhoods registered approximately a 30% increase in SFR relative to 2019.

We then examine variation in the geographic demography of these dynamics in the SFR by comparing high- and low-income neighborhoods (Figures 8C and 9C). Similar to our earlier analyses, we separate out the coefficients associated with high-income versus low-income zip codes on a week-by-week basis relative to passage of the CARES Act. On the one hand, low-income neighborhoods register very little impact of the pandemic and policy response – the rate of new business formation does not change by more than 5% with the onset of the pandemic, or with the passage and implementation of the CARES Act. In contrast, the SFR in high-income zip codes plummeted at the onset of the pandemic (with a decline of more than 50% relative to 2019 in the four weeks prior to the passage of the CARES Act), followed by a rebound and surge to more than 20% above 2019 levels (which persists for the remainder of 2020).

Finally, we combine these two findings to examine specifically the dynamics observed in predominantly Black high-income neighborhoods (Figures 8D and 9D). Specifically, we construct the week-by-week coefficients for zip codes that are simultaneously in the top 25% in terms of Black population share and also in the top 25% of median income. The results are striking: the weeks prior to the CARES Act are associated with a steeper decline in startup formation and the weeks after the CARES Act are associated with a steeper rebound and subsequent surge. The decline in startup formation in Black high-median-income neighborhoods was more than 50% in the weeks prior to the passage of the CARES Act. In these same neighborhoods, startup formation rates had risen to 50% above 2019 levels by 12 weeks after the passage of the CARES Act.

Next, using the same methodology, we implement a simple regression analysis that allows us to capture the changing level of the SFR in the weeks preceding and subsequent to the Supplemental Act. Specifically, Figures 10 and 11 examine the relationship between the passage and implementation of this legislation and the changing geographic demography of entrepreneurship. Notably, relative to the precipitous decline observed prior to the CARES Act (the result of the pandemic, lockdowns and social distancing), the trend in the weeks prior to the Supplemental Act is effectively flat (if anything, there is a very small downward trend). However, with the passage of the Supplemental Act, we observe an 8% additional improvement

in the SFR within two weeks of passage (relative to the first weeks of 2020), and this effect is again concentrated in neighborhoods with a high fraction of Black residents, high median incomes, and high-income Black neighborhoods. Overall, this second set of findings suggests that the particular shifts observed during 2020 may have longer-lasting implications for the overall geography and geographic demography of entrepreneurship going forward.

V.   Conclusions

As a leading economic indicator, new firm formation rates can signal recession, stagnation or growth. Changes in the rate and geography of startup formation during times of crisis can surface potential paths to economic recovery and targeted priorities for policy. This paper leverages our unique dataset of business registration records to further investigate the observed startup surge over the course of the COVID pandemic and to add a new layer of granularity to the wave of recent scholarship around this important phenomenon. Building on our prior work, we provide several new views of startup formation in 2020 that help to decompose observed trends by both entrepreneurial quantity and quality as well as by geography. Looking at the startup surge through these lenses yields several interesting observations and surfaces important insight for both local and federal policy.

Across all eight states, the road to recovery appears to be through "Main Street." Rebound and expansion in startup formation is being led by new businesses formed as LLCs and partnerships –new businesses that generally rely on debt financing (as opposed to venture capital) to grow. Federal programs making low-interest loans available for fledgling firms is likely to be fundamental in converting the entrepreneurial potential of the 2020 increase in new firm formation into economy-wide growth.

The microgeography of the 2020 surge in startup formation likewise yields important insights for policy. Increases in the Startup Growth Ratio are not associated with traditional hubs of business dynamism in regions across the country, but instead centered in areas with a higher Black population. In metro regions from New York City to Houston to Atlanta, communities with a greater percentage of Black residents are experiencing larger relative increases than other areas in startup formation. Though our analysis is not causal, it is useful to note that the federal relief payments, and their uniform distribution (independent of eligibility criteria), may have played a role in enabling new firm formation in Black neighborhoods which might otherwise

have been constrained by discrimination. Moreover, given the unequal historical access to capital, talent and markets for minority business enterprises (MBE; Bates, 2011), bias in the allocation of critical entrepreneurial inputs may hinder the United States' ability to fully realize potential economic gains associated with the 2020 surge in new business formation. Put another way, the changing geography of entrepreneurship during 2020 highlights the importance of MBE growth in economic recovery. Indeed, initiatives like BE NYC (Black Entrepreneurs NYC) launched in 2019 are aimed at increasing Black entrepreneurship by bringing access to capital, business background, reliable resources, customers, affordable workspaces and networking to Black-owned businesses.[4] The knowledge, networking and market access that such initiatives can bring to fledgling firms may complement more blunt federal policies by increasing access to capital.

   More generally, the 2020 boom in new firm formation is significant in its magnitude, composition, and varied geography. By adding new lenses to our view of the 2020 surge in startup formation and examining how those patterns are linked with the federal relief legislation, our analysis offers insight for federal and state policy. Initiatives aimed at encouraging an inclusive recovery may benefit from identifying and reducing barriers to new business formation.
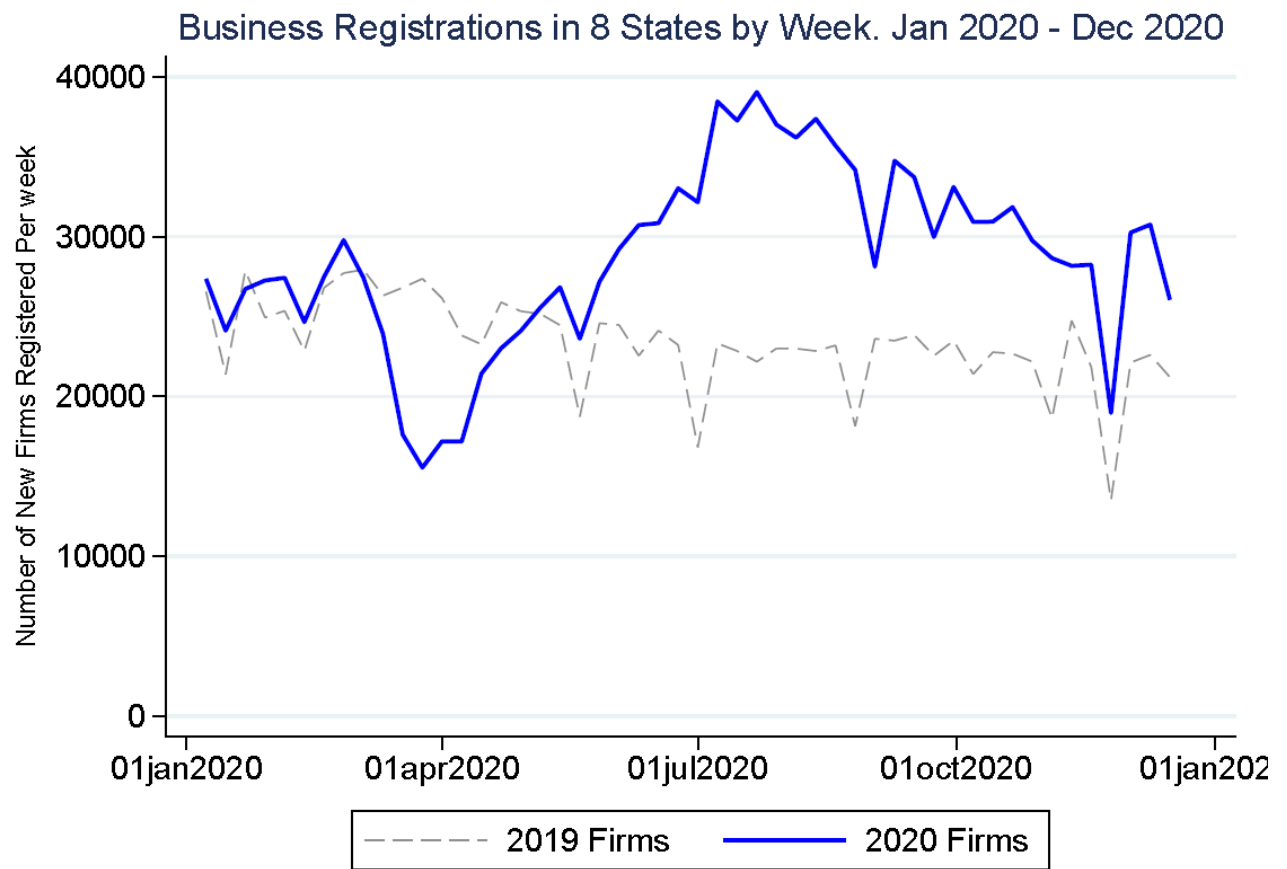
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[4] https://www1.nyc.gov/site/sbs/businesses/black-entrepreneurs-nyc.page

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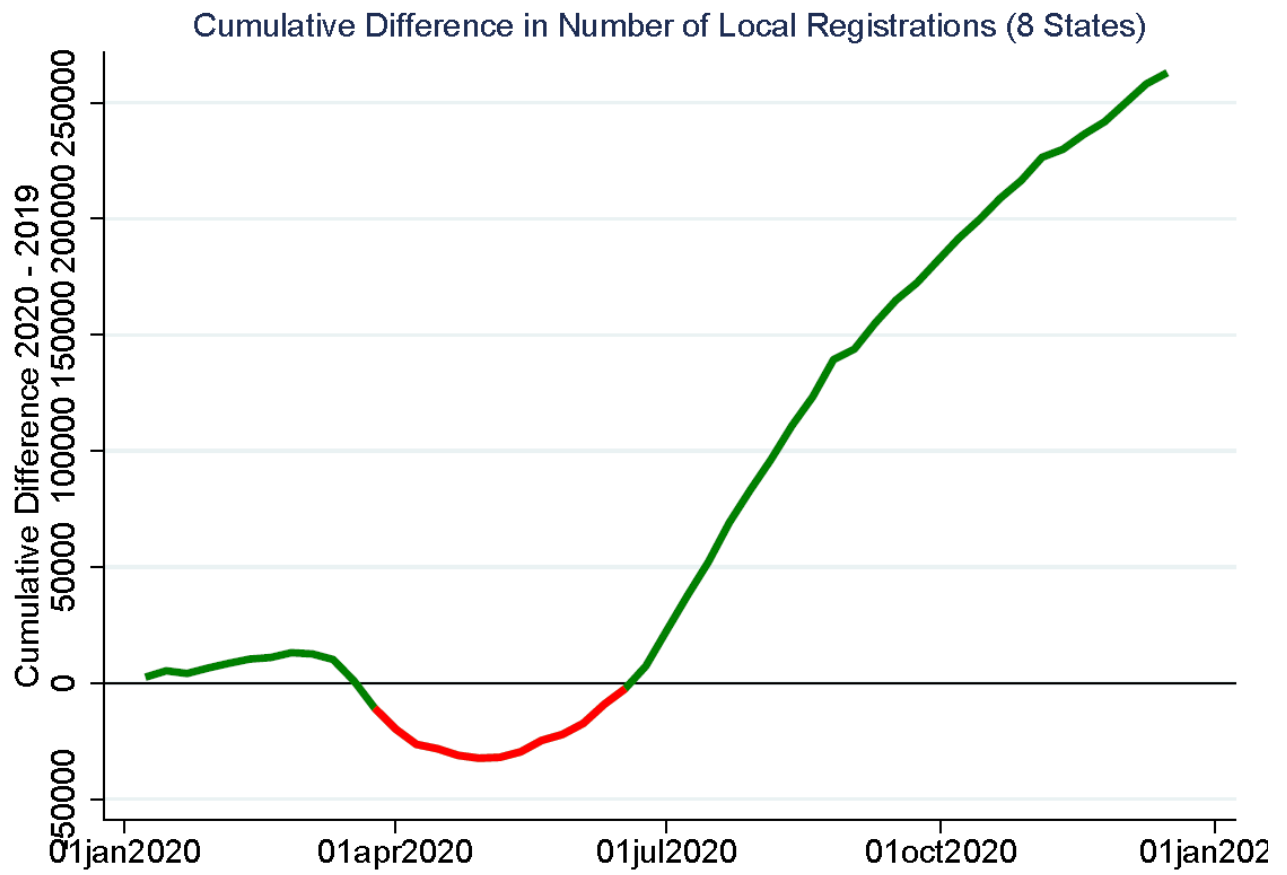
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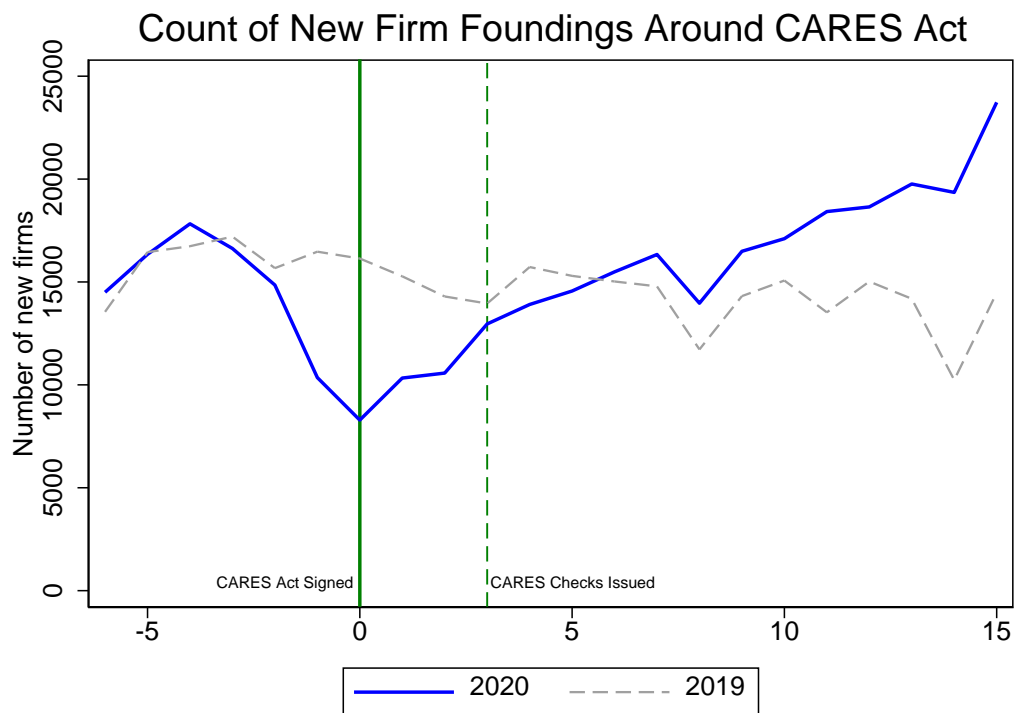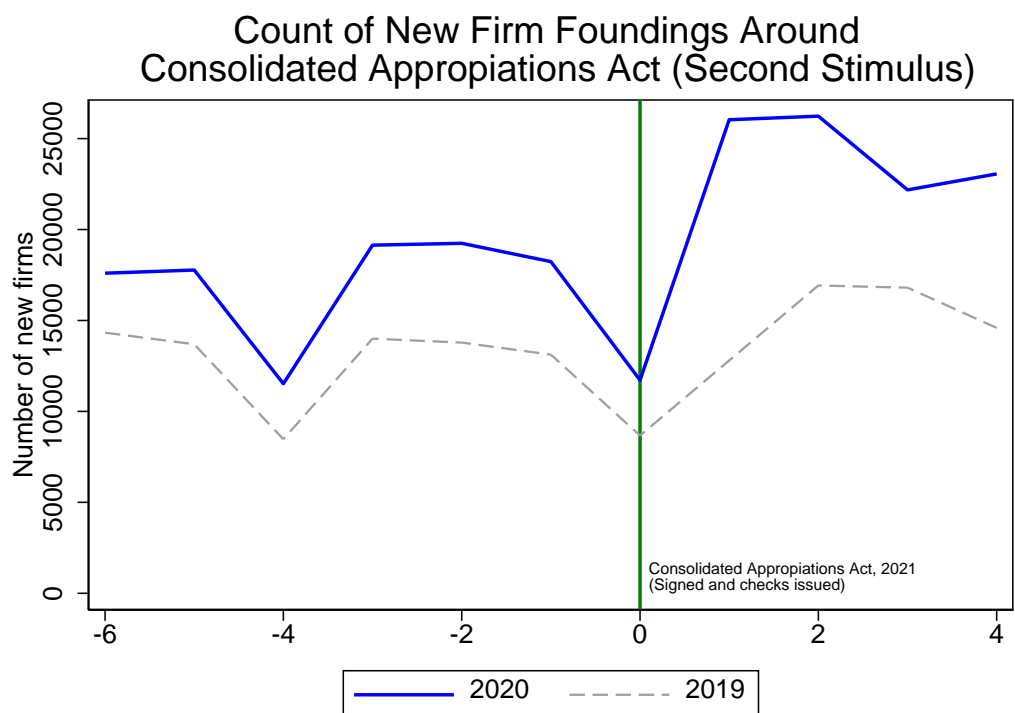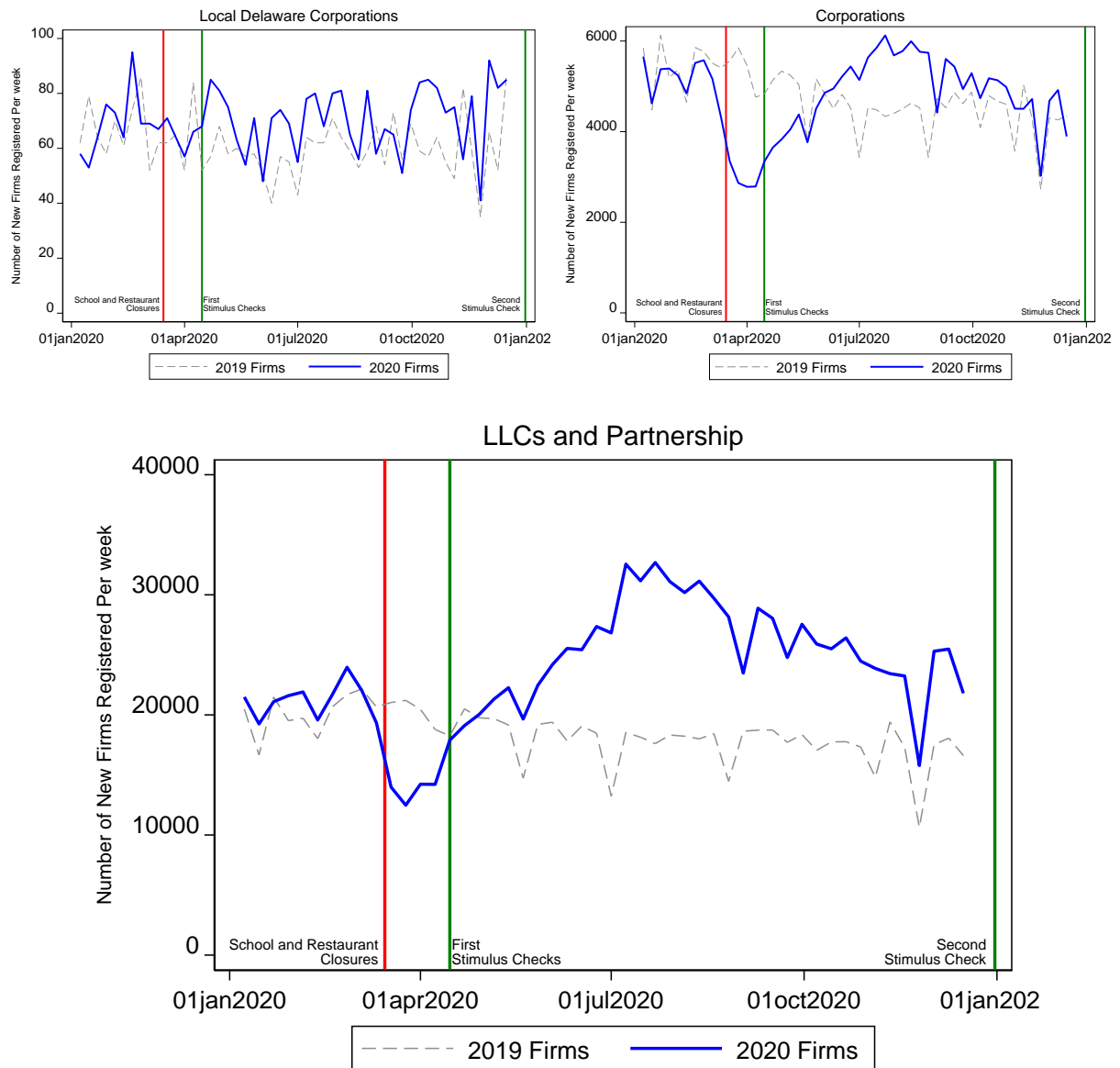
Figure 1A

Business Registrations in 8 States by Week. Jan 2020 - Dec 2020

Figure 1B

Cumulative Difference in Number of Local Registrations (8 States)

Figure 1C

Count of New Firm Foundings Around CARES Act

CARES Act Signed

CARES Checks Issued

Number of new firms

2020 --- 2019

Figure 1D

Count of New Firm Foundings Around Consolidated Appropiations Act (Second Stimulus)

Consolidated Appropiations Act, 2021
(Signed and checks issued)

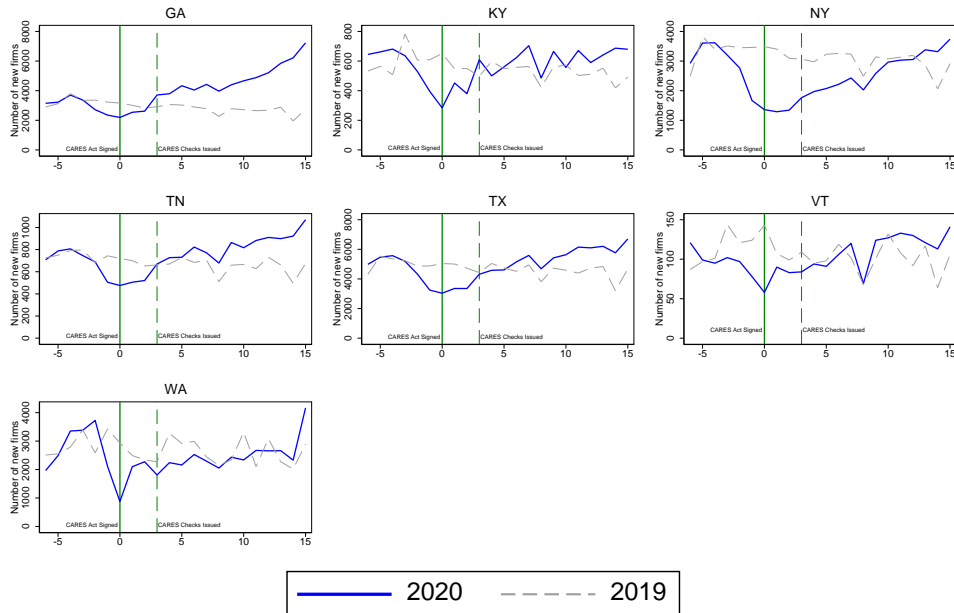Number of new firms

2020 --- 2019

Figure 2

Figure 3A

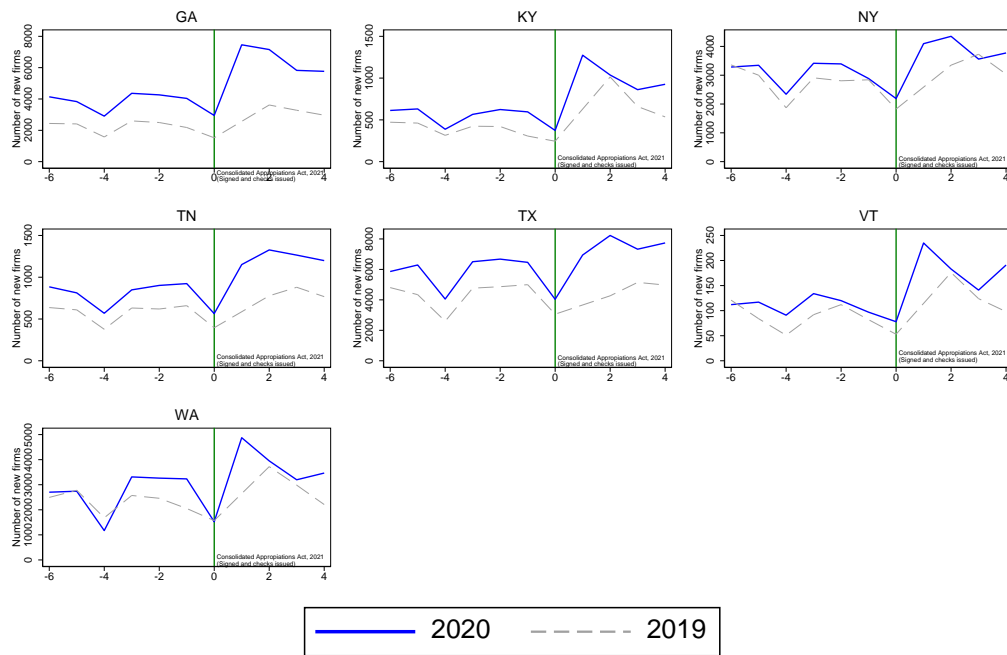### Cumulative Difference in Number of Local Registrations. 2019 to 2020
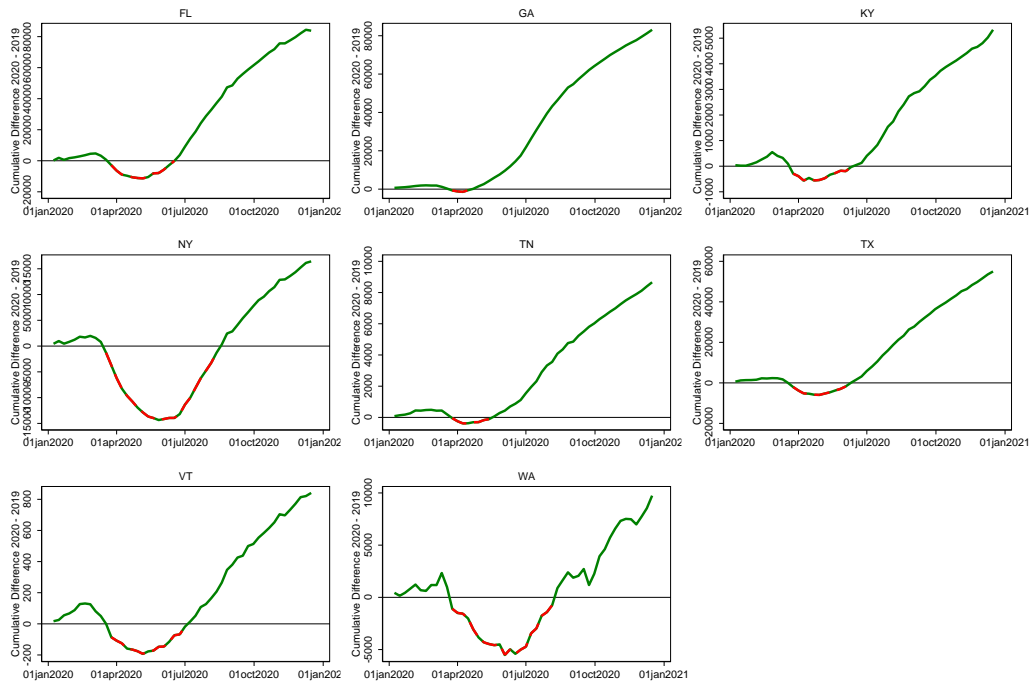
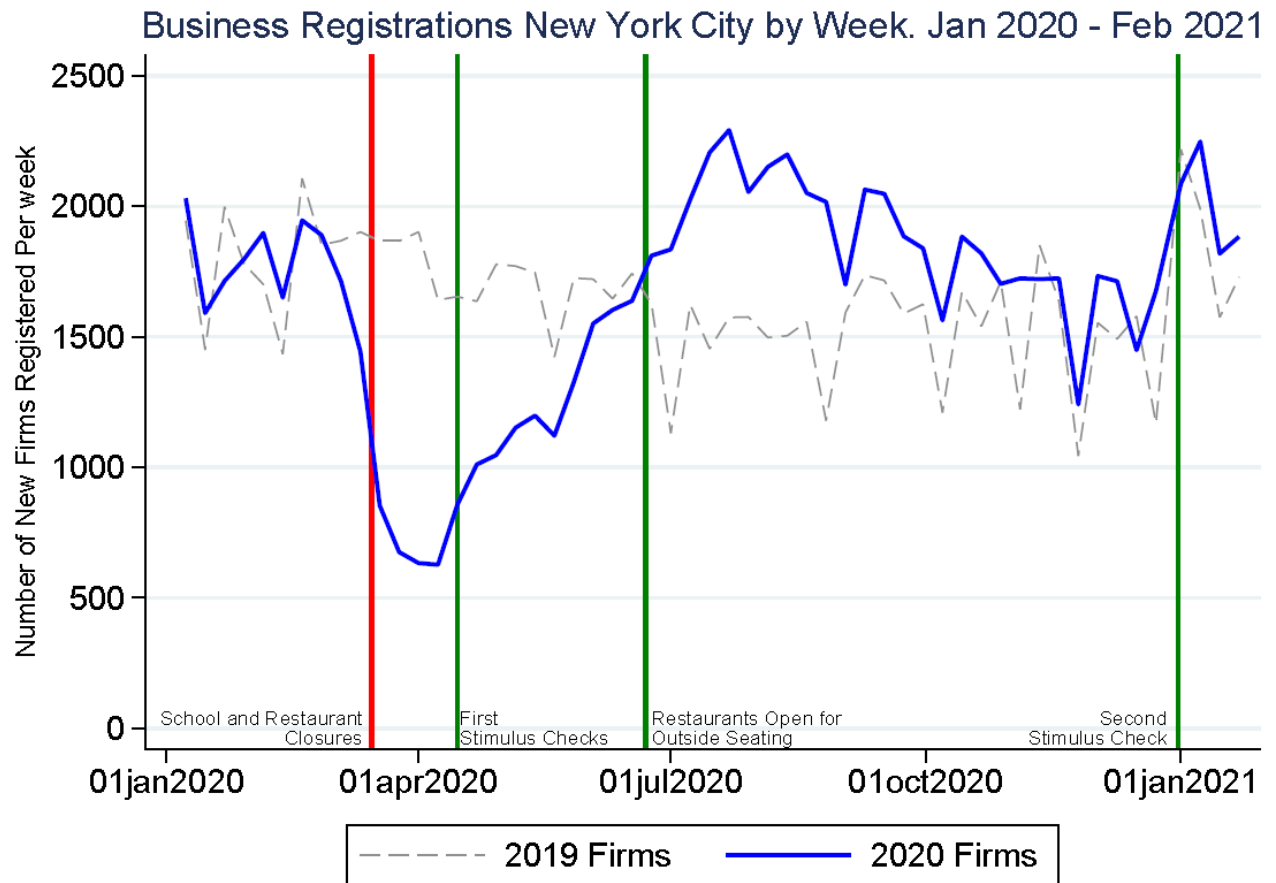## Figure 3B

COVID Startup Evolution by State
CARES Act

Figure 3C

COVID Startup Evolution by State
Consolidated Appropriations Act (second stimulus)
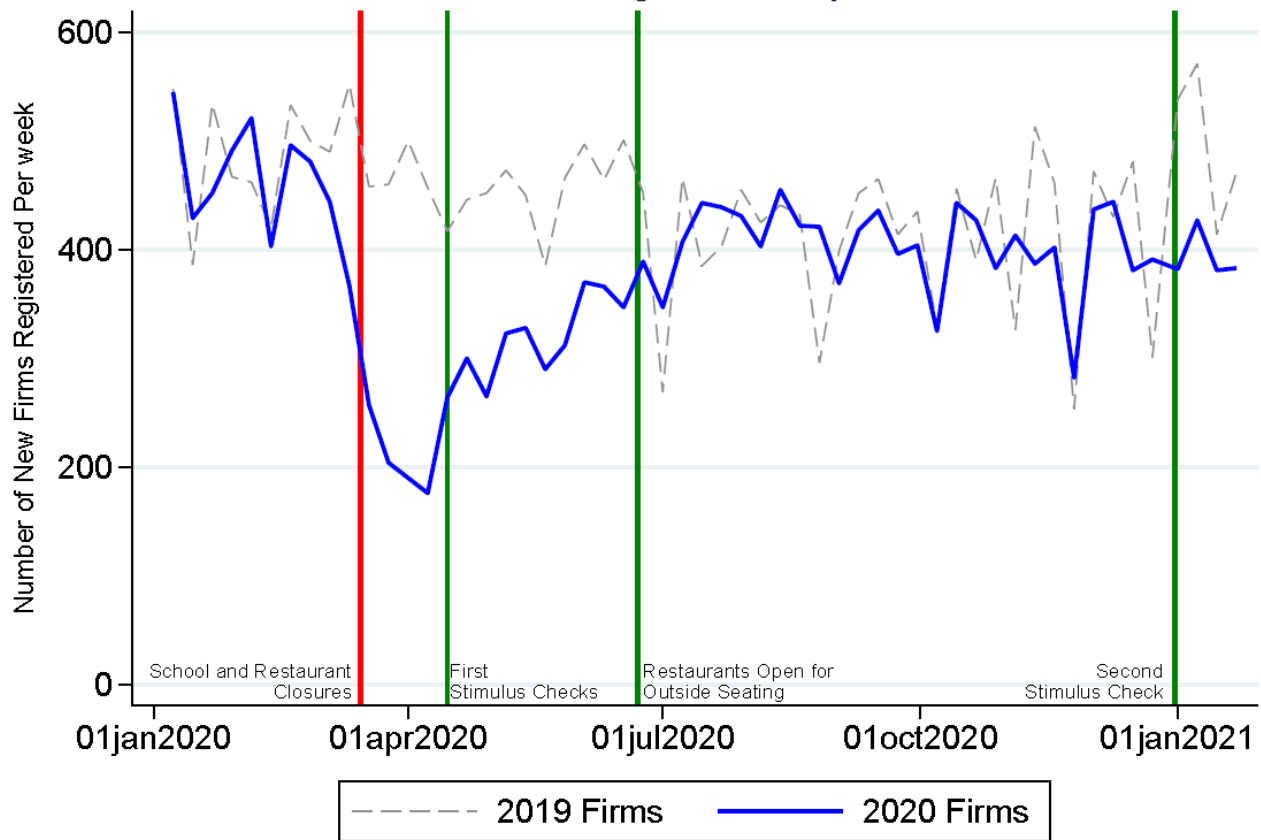

2020   2019

Figure 4A

Business Registrations New York City by Week. Jan 2020 - Feb 2021
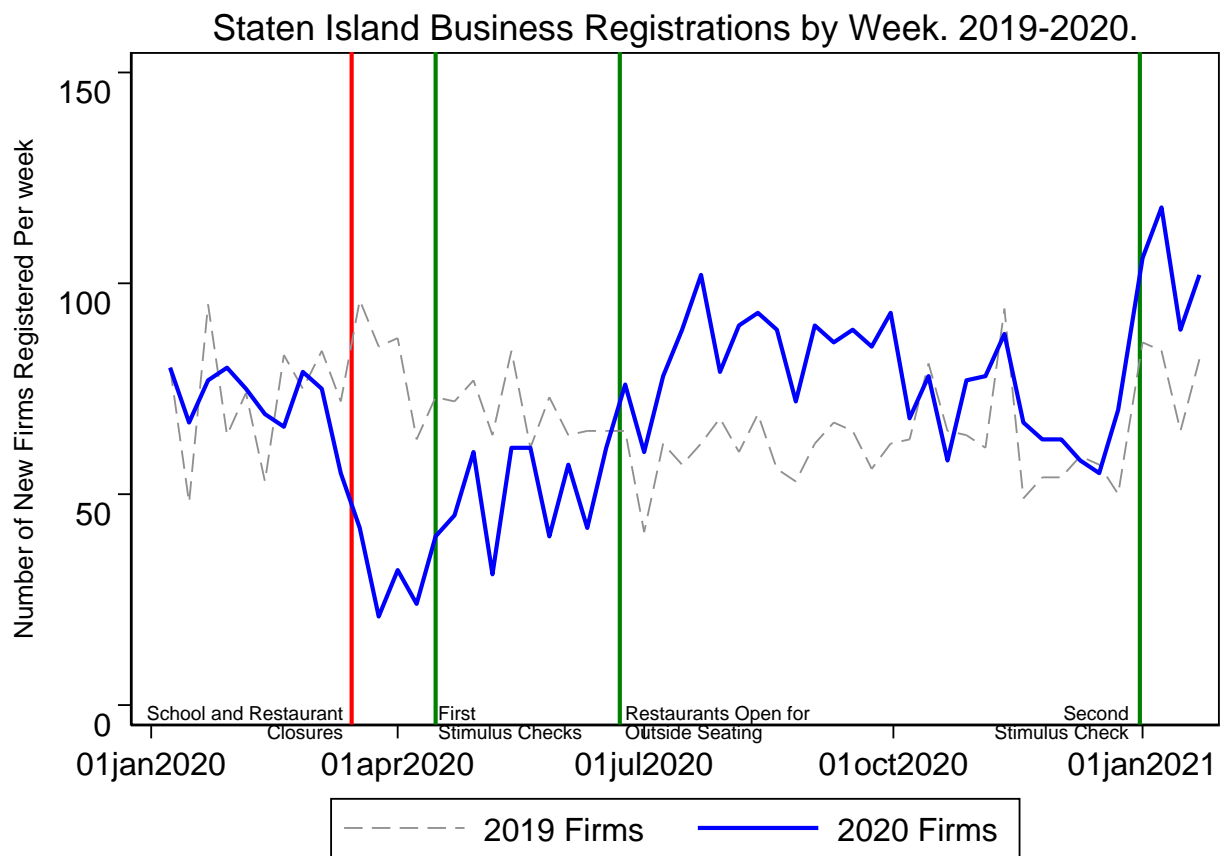
Figure 4B

Manhattan Business Registrations by Week. 2019-2020.

Figure 4C

Staten Island Business Registrations by Week. 2019-2020.

Figure 4D

Bronx Business Registrations by Week. 2019-2020.
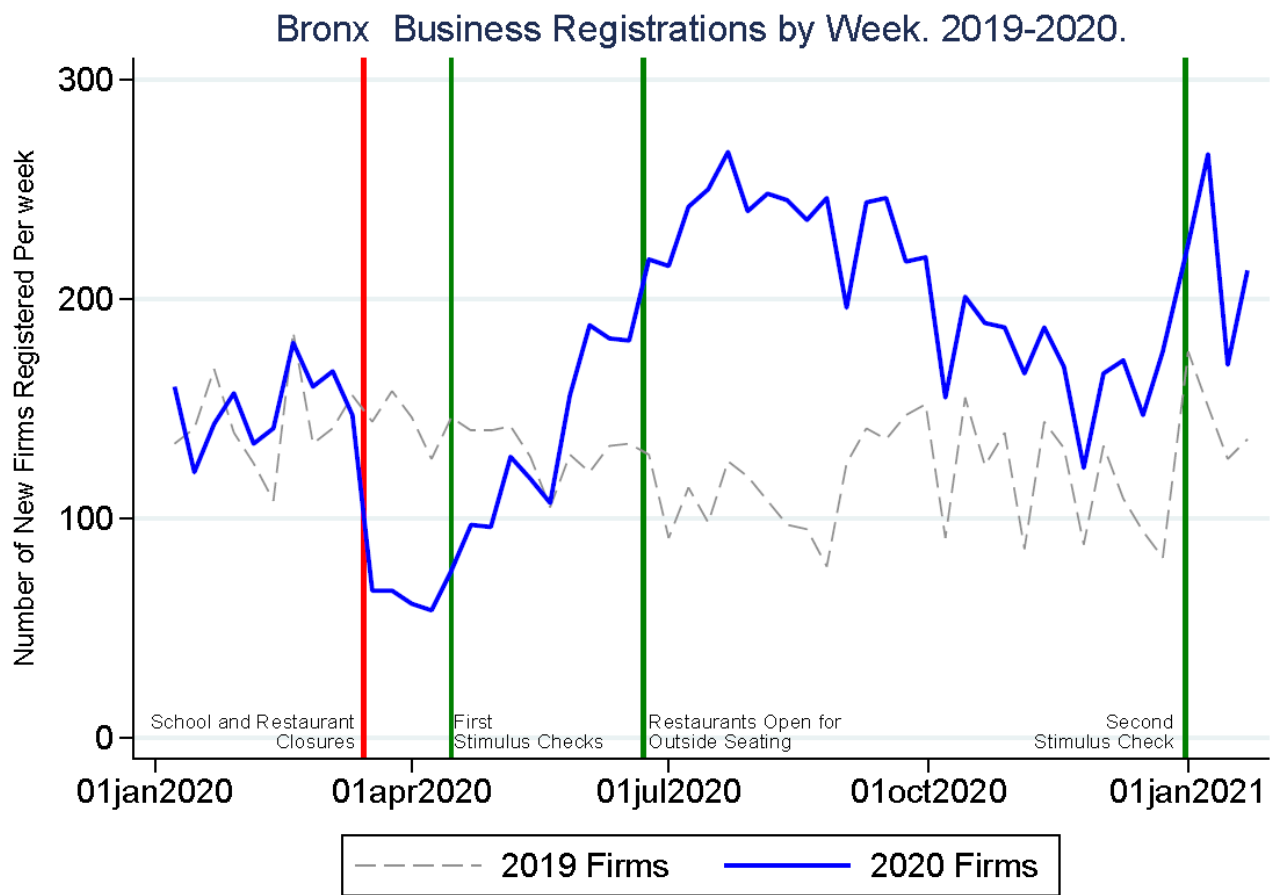
Figure 4E

Brooklyn Business Registrations by Week. 2019-2020.

School and Restaurant
Closures

First
Stimulus Checks

Restaurants Open for
Outside Seating

Second
Stimulus Check

- - - - 2019 Firms   —— 2020 Firms

Y-axis: Number of New Firms Registered Per week

X-axis: 01jan2020, 01apr2020, 01jul2020, 01oct2020, 01jan2021

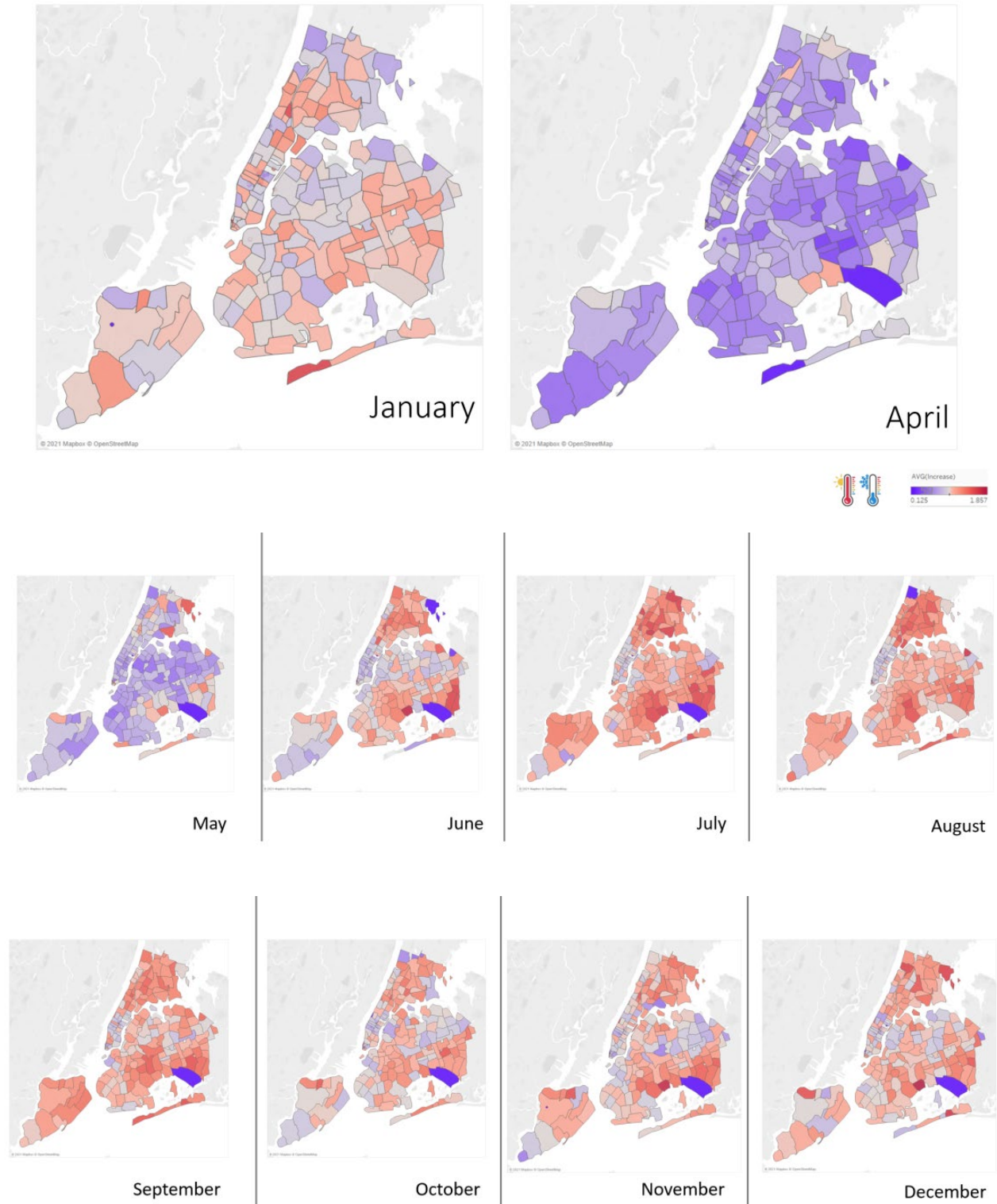**Figure 4F**

Queens Business Registrations by Week. 2019-2020.

Figure 5A

2020 vs. 2019 NYC Startup Formation: Zip Code View

January

April

AVG(Increase)

0.125   1.857

May

June

July

August

September

October

November

December

Figure 5B

NY Metro SFR 2020 v. 2019
January - March

April-June

July-September

October-December

Figure 6A
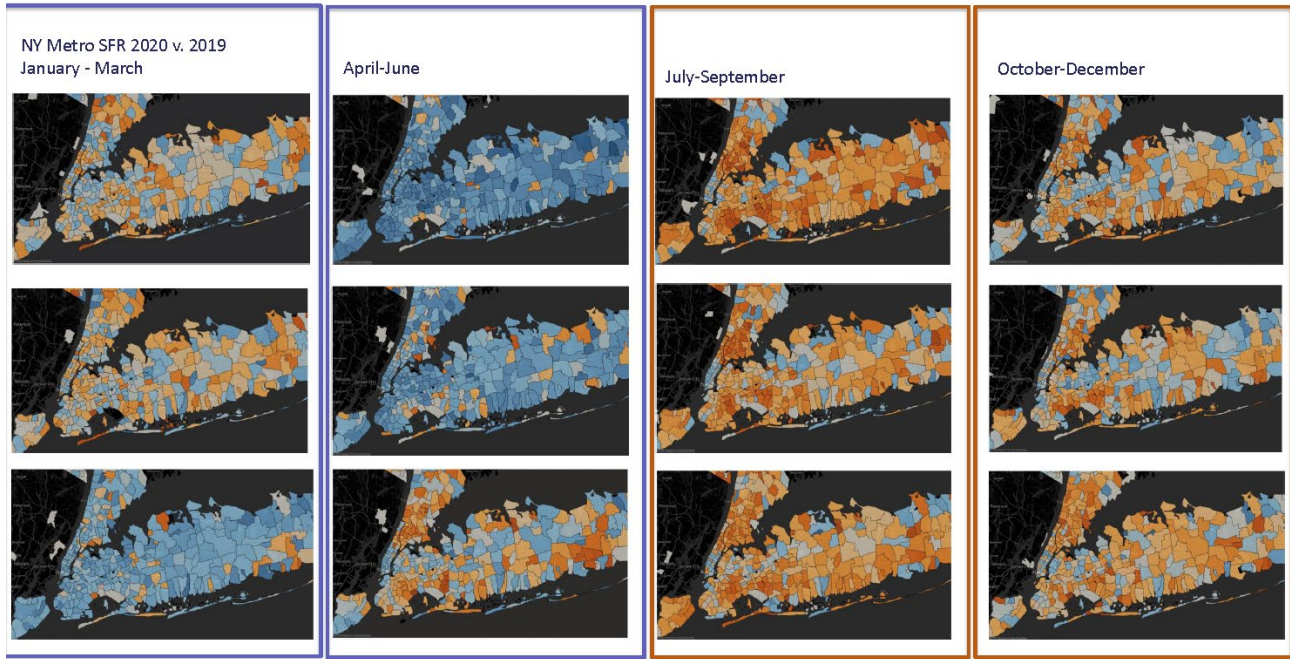

ATLANTA Business Registrations by Week in 2020.

Figure 6B

2020 v. 2019 Startup Formation in Atlanta

By Zip Code

January

April

July

Figure 6C

HOUSTON Business Registrations by Week in 2020.
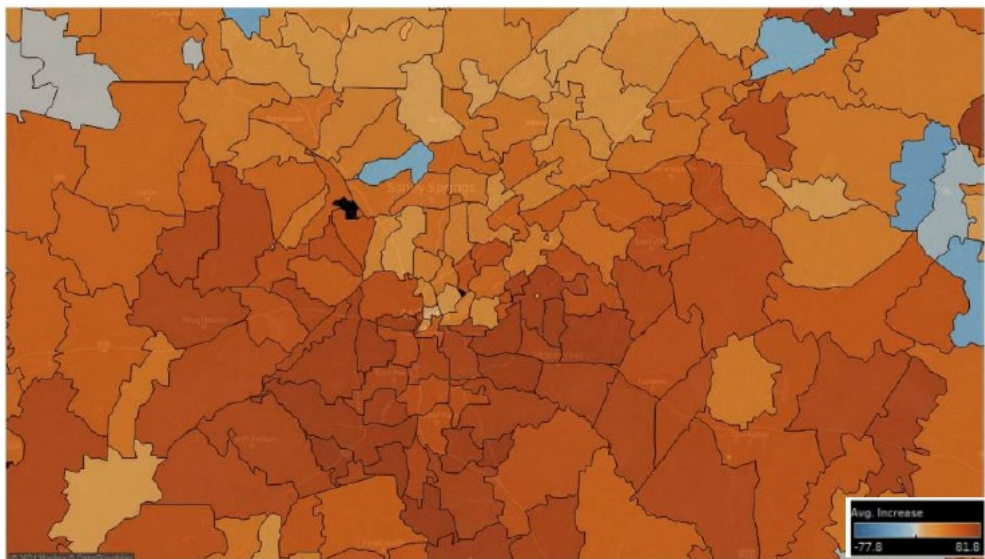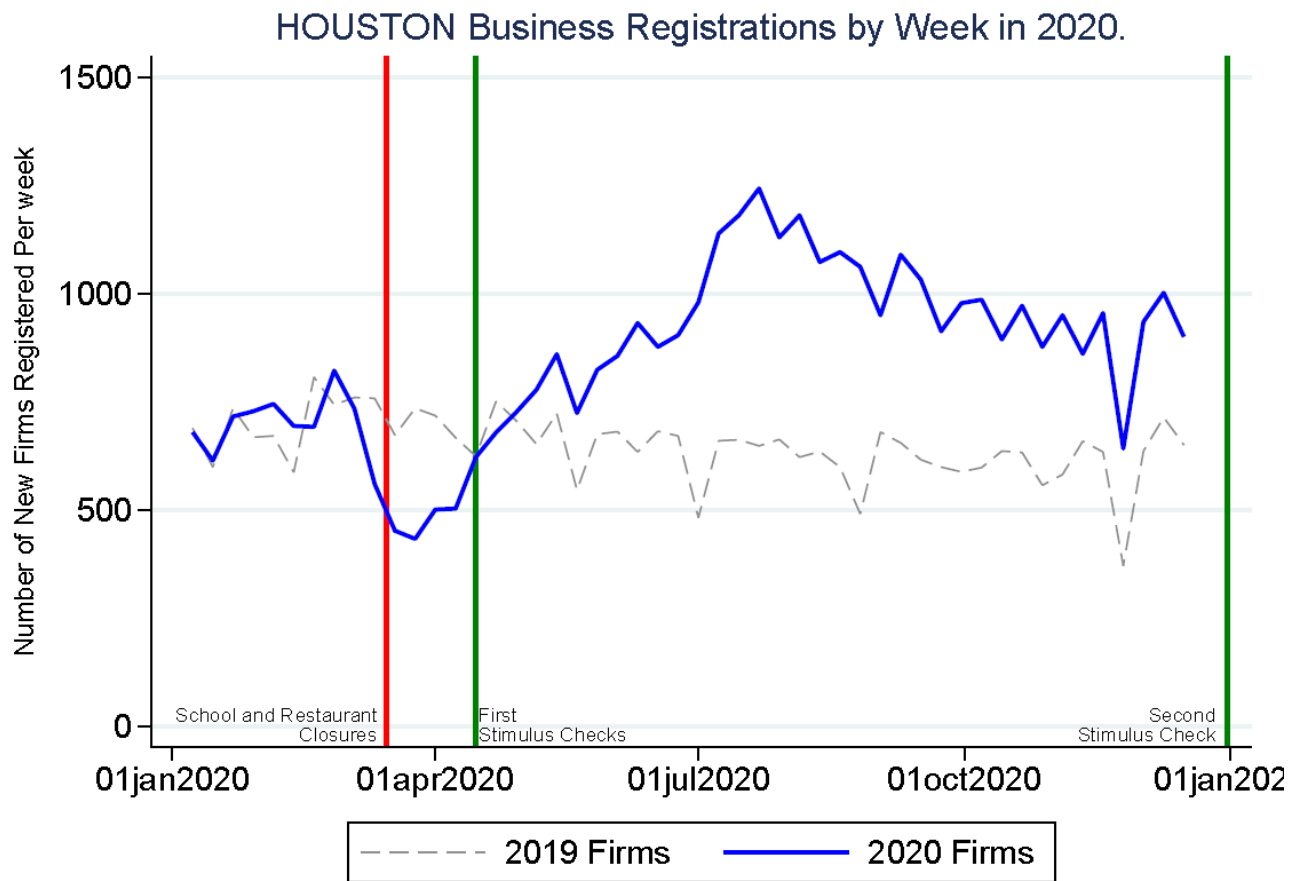
Figure 6D

2020 v. 2019 Startup Formation in Houston

By Zip Code

January

April

July

Avg. Increase
-77.8   81.8
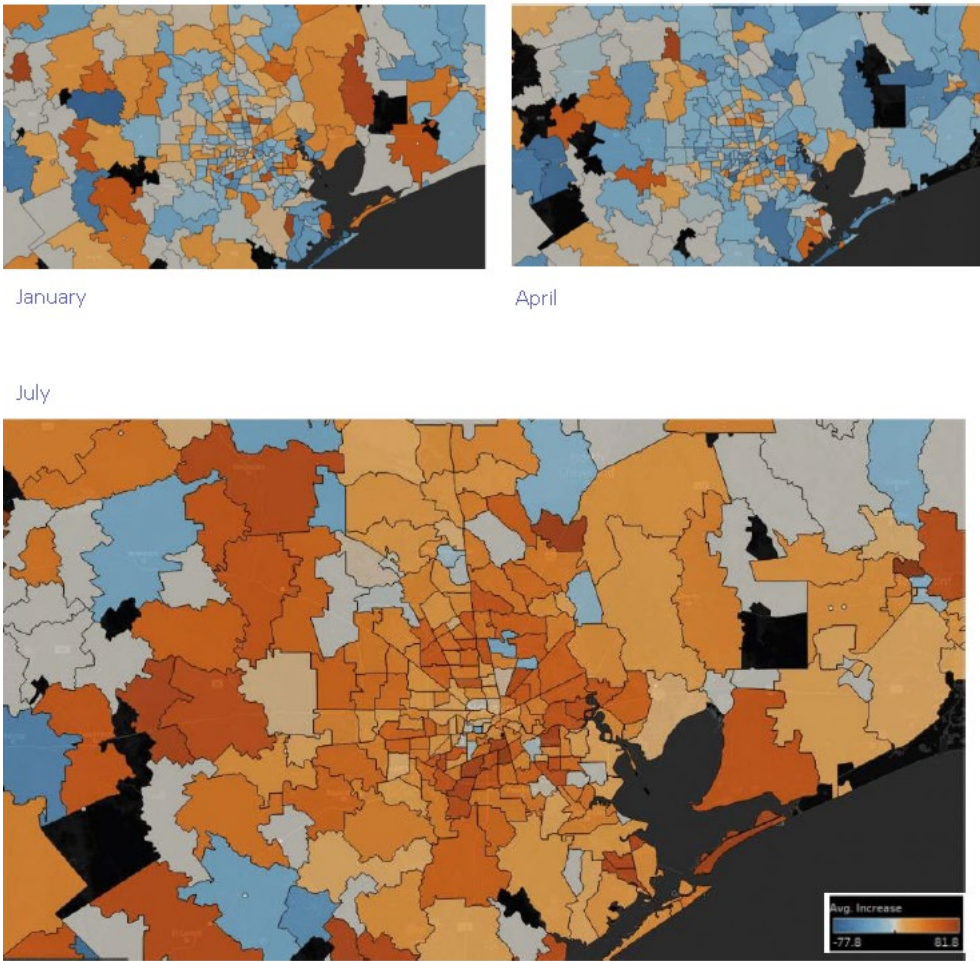
Figure 6E

MIAMI Business Registrations by Week in 2020.

Y-axis: Number of New Firms Registered Per week (0, 500, 1000, 1500, 2000)

X-axis: 01jan2020, 01apr2020, 01jul2020, 01oct2020, 01jan202

Annotations: School and Restaurant Closures; First Stimulus Checks; Second Stimulus Check

Legend: 2019 Firms; 2020 Firms
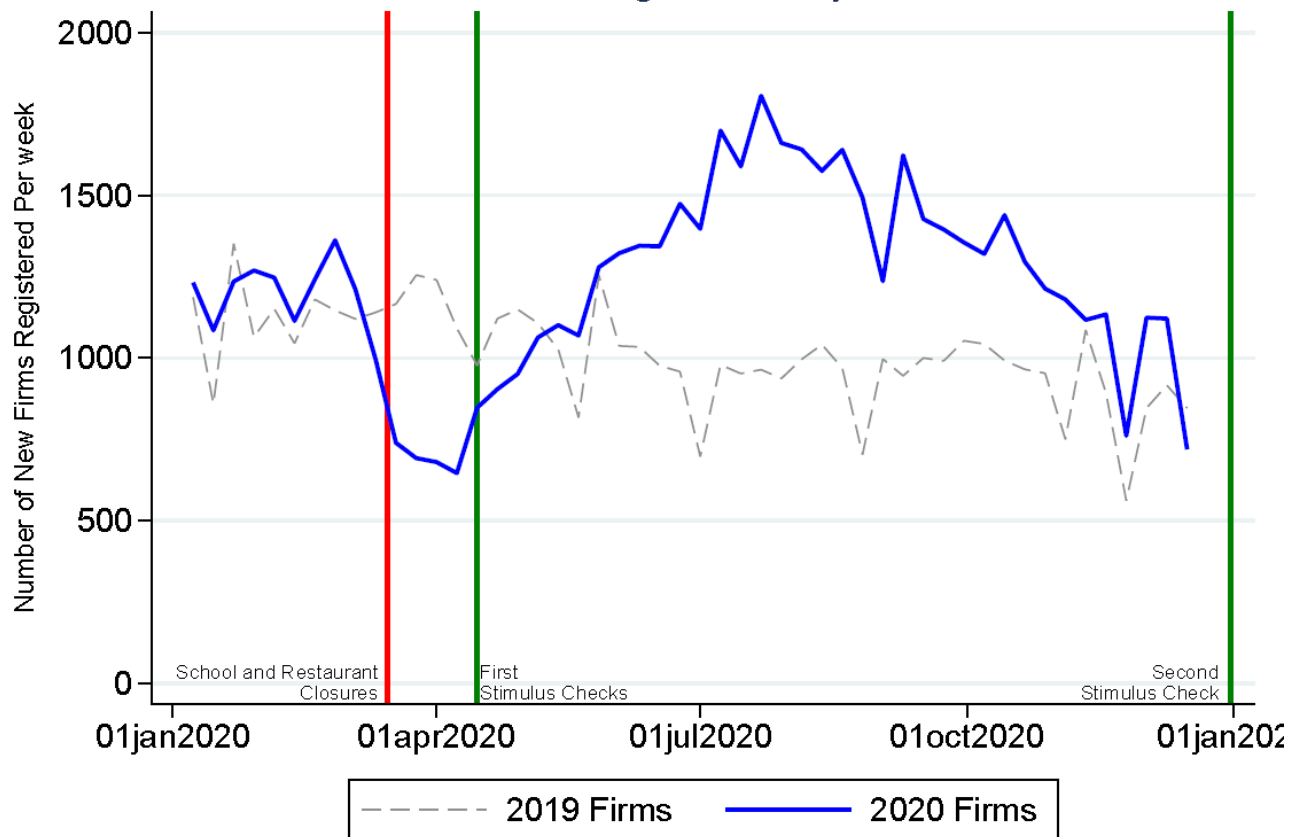
Figure 6F

2020 v. 2019 Startup Formation in Southern Florida

By Zip Code

January

April

July

Figure 7

Proportion of people non-Hispanic Black

Log Median Income

Persons per square mile
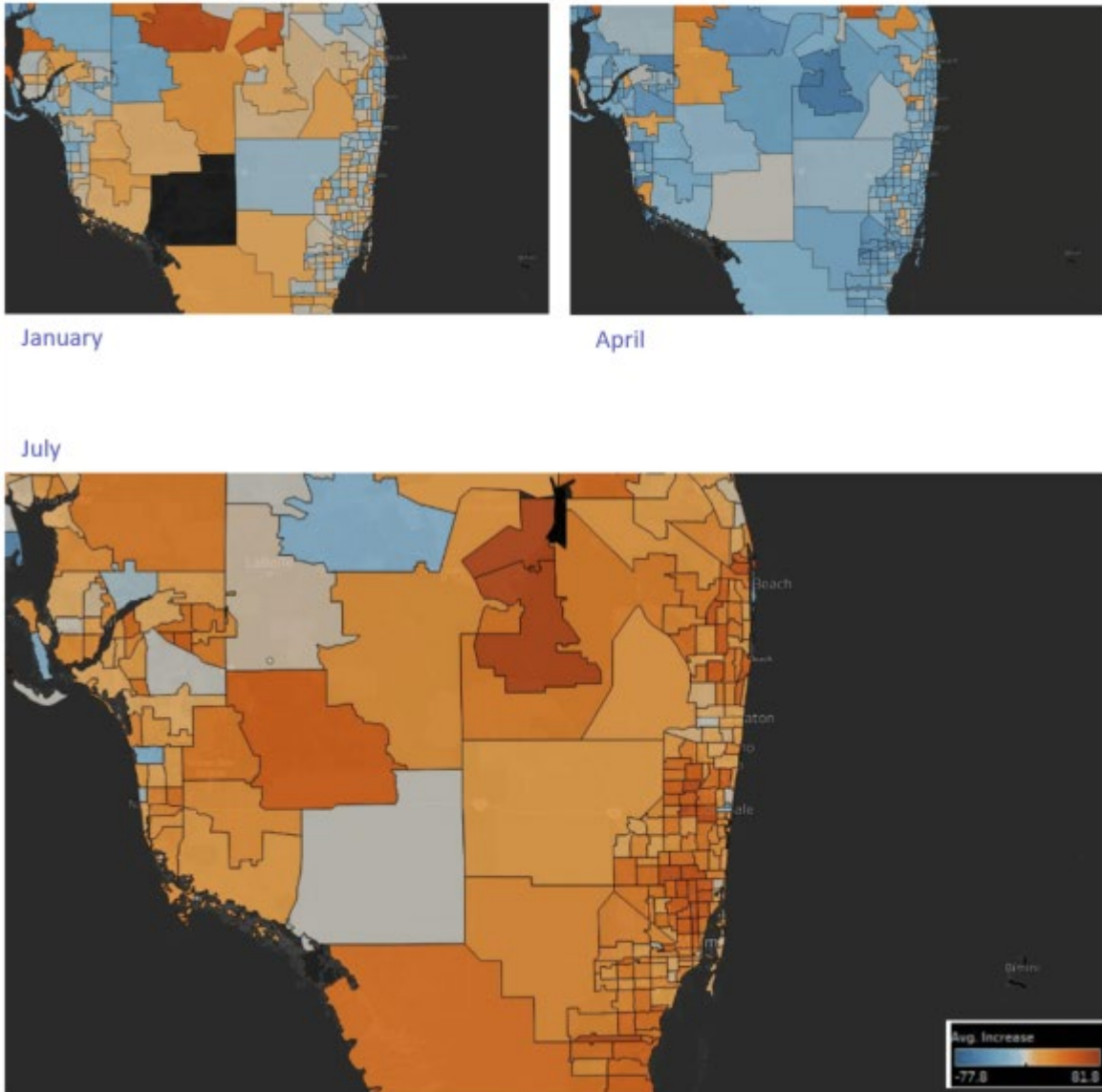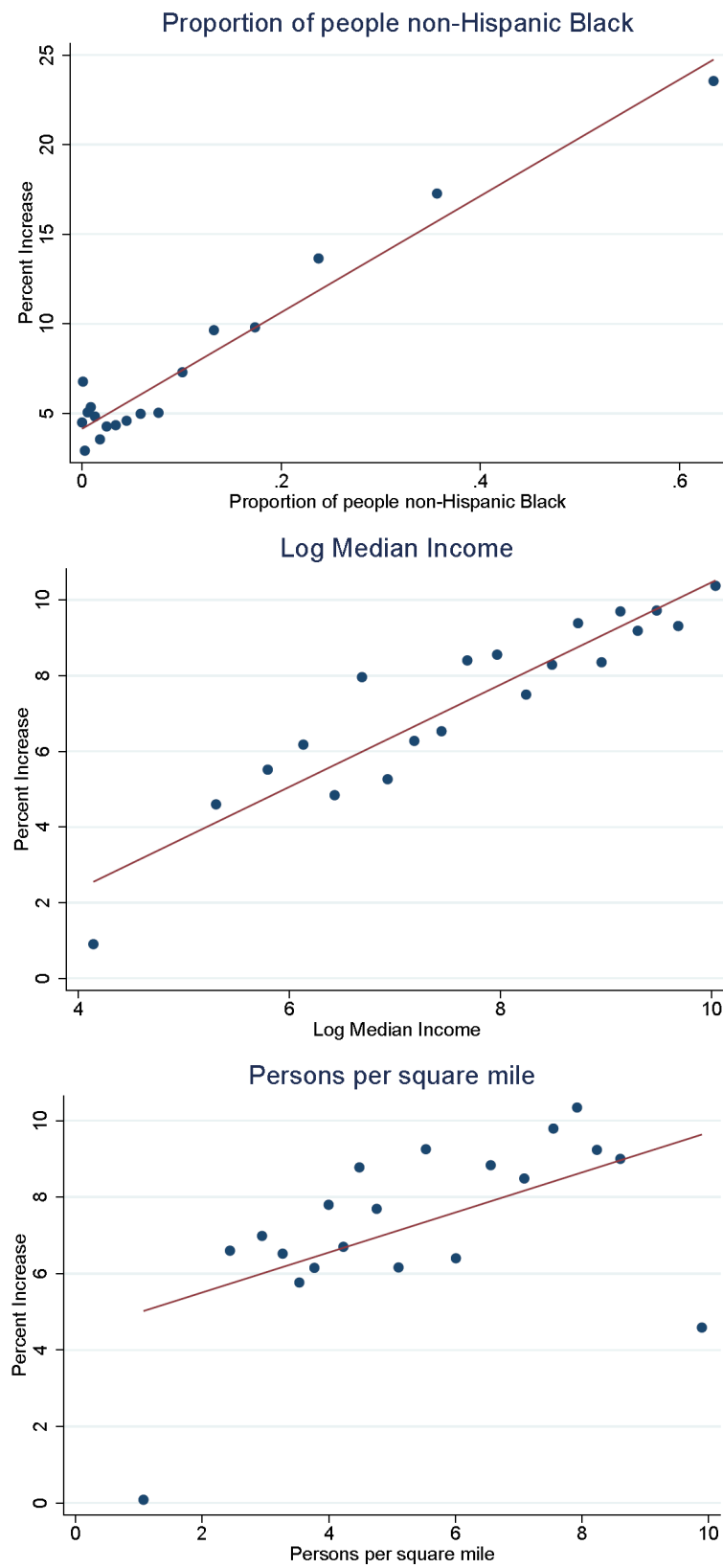
Figure 8

COVID 19 Pandemic Onset and the Impact of the CARES Act

Figure 9

COVID 19 Pandemic Onset and the Impact of the CARES Act
Log Number of Firms
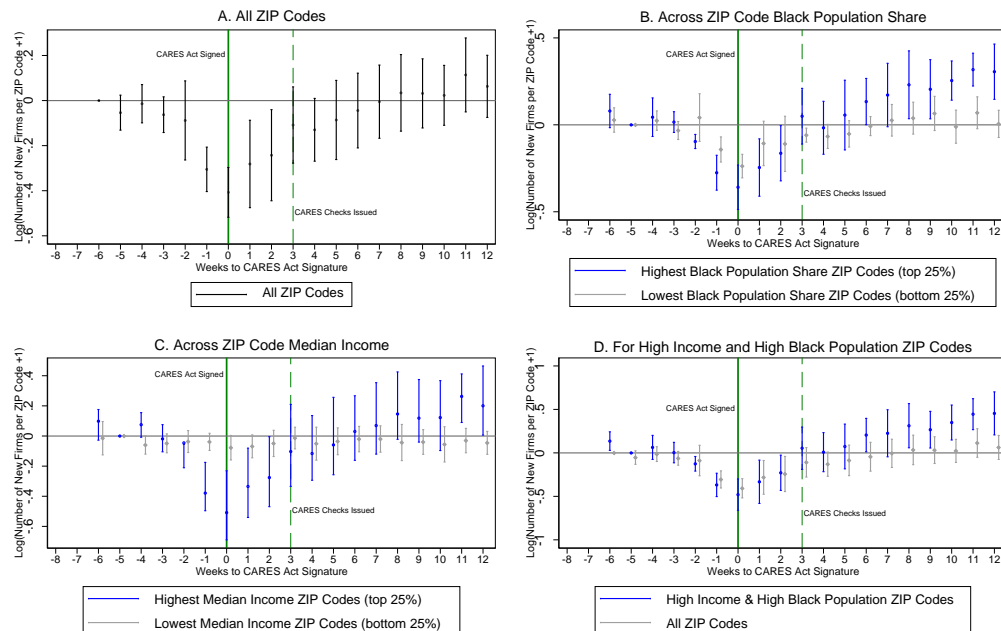
Figure 10

Relief Supplemental Appropriations Act of 2021 (second stimulus)
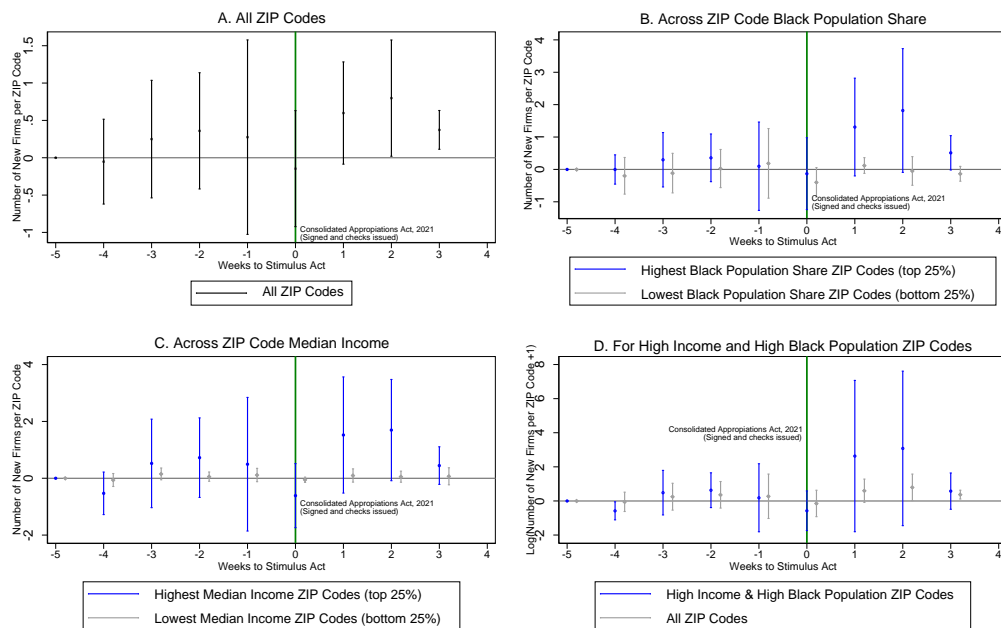
Figure 11

Relief Supplemental Appropriations Act of 2021 (second stimulus)
Log Number of Firms
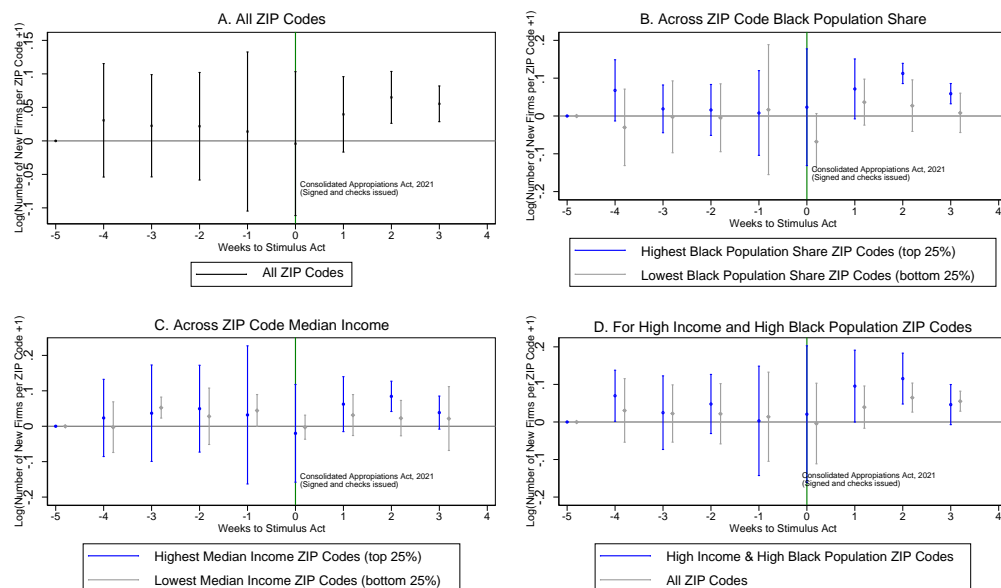
TABLE 1A

Variable Definition and Summary Statistics – Core Business Registration Data

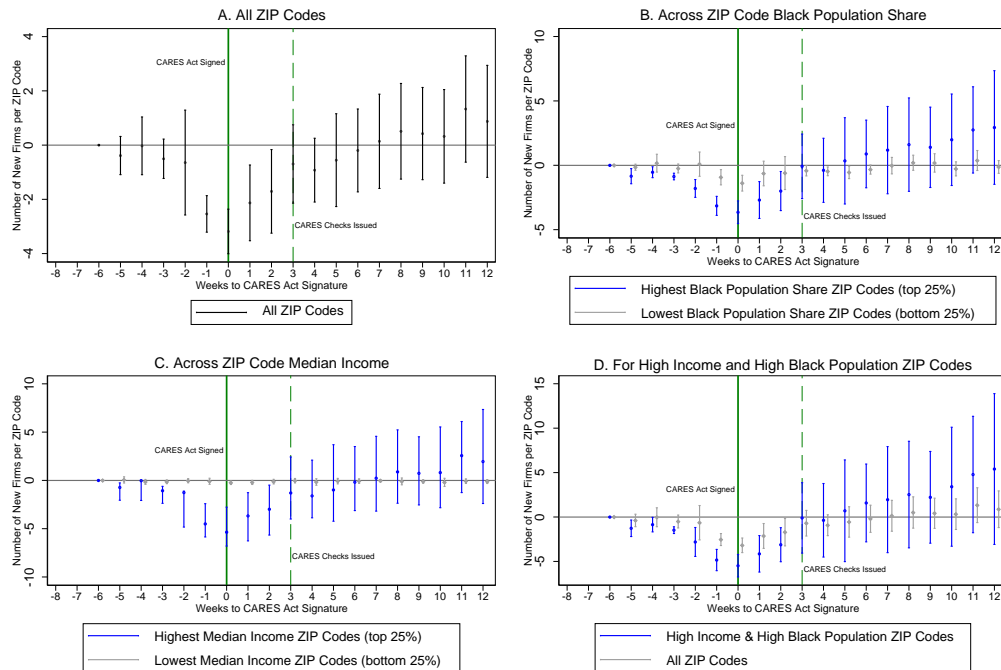| Variables	Source	Mean	Std. Dev.
Business Registration			
Local corporation	Startup Cartography Project	0.16	0.38
Local LLC or partnership	Startup Cartography Project	0.82	0.36
Delaware corporation	Startup Cartography Project	0.014	0.12
Delaware LLC and partnerships	Startup Cartography Project	0.0005	0.07
Total number of states		8	
Total number of business registrations		2,824,748	

TABLE 1B
Variable Definition and Summary Statistics – ZCTA Data

Variables	Source	Mean	Std. Dev.
Outcome Variables			
Startup Growth Ratio between 2019 and 2020, full year	Startup Cartography Project	12.111	23.017
Startup Growth Ratio between 2019 and 2020, from May to December	Startup Cartography Project	7.205	21.166
Business Registration Measures			
Number of business registrations in 2019	Startup Cartography Project	106.91	196.16
Number of business registrations in 2020	Startup Cartography Project	145.22	280.92
Demographic Measures			
Persons per square mile	ACS Demographic and Housing Estimates (2013-2017)	5.277	2.318
Proportion Hispanic origin	ACS Demographic and Housing Estimates (2013-2017)	14.51	20.36
Proportion non-Hispanic Black	ACS Demographic and Housing Estimates (2013-2017)	9.387	15.71
Proportion Bachelor's Degree or Above	ACS Demographic and Housing Estimates (2013-2017)	24.98	16.84
Proportion Below Poverty Level	ACS Demographic and Housing Estimates (2013-2017)	15.71	10.77
Proportion of owner occupied houses	ACS Demographic and Housing Estimates (2013-2017)	70.55	18.21
Share of Working Age Population	ACS Demographic and Housing Estimates (2013-2017)	66.76	7.918
Ln(Median Income)	ACS Demographic and Housing Estimates (2013-2017)	7.540	1.682
Population in 2019	ACS Demographic and Housing Estimates (2019)	13,750.18	17,270.76
Total number of ZCTA		7,307	

TABLE 2
Local ZIP Code Characteristics and May-Dec Increase in Entrepreneurship

	Coefficients	R^2	Observations
Persons per square mile	0.523	0.003	6947
	(0.457)		
Proportion non-Hispanic Black	0.326***	0.058	6947
	(0.0509)		
Proportion Hispanic origin	0.0224	0.000	6947
	(0.0309)		
Proportion Bachelor's Degree or Above	-0.103*	0.006	6945
	(0.0376)		
Share of Working Age Population	-0.00849	0.000	6947
	(0.0608)		
Proportion Owner Occupied Housing	-0.0911*	0.006	6926
	(0.0307)		
Ln(Median Income)	1.342*	0.010	6929
	(0.468)		

OLS univariate regressions. The dependent variable is Startup Growth Ratio from May to December in 2020 compared to 2019 in each ZIP Code. Standard errors clustered by state.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 3
Local ZIP Code Characteristics and Increase in Entrepreneurship with Controls

	(1) Startup Growth Ratio (Full Year)	(2) Startup Growth Ratio (Full Year)	(3) Startup Growth Ratio (Full Year)	(4) Startup Growth Ratio	(5) Startup Growth Ratio (Full Year)	(6) Startup Growth Ratio (Full Year)
Proportion non-Hispanic Black	0.317***	0.245***	0.231***	0.334***	0.202***	0.186***
	(0.0646)	(0.0377)	(0.0514)	(0.0367)	(0.0392)	(0.0529)
Proportion Hispanic origin	0.00607	0.0434	0.0397	0.0685**	0.0486	0.0446
	(0.0198)	(0.0398)	(0.0498)	(0.0268)	(0.0411)	(0.0504)
Ln(Median Income)	0.967	0.939	1.280	1.232	0.491	0.827
	(0.599)	(0.706)	(1.249)	(0.915)	(0.724)	(1.264)
Proportion non-Hispanic Black # Ln(Median Income)					0.0603***	0.0672***
					(0.0113)	(0.0148)
Persons per square mile	-0.295	0.211	0.317	-0.237	0.177	0.289
	(0.548)	(0.287)	(0.387)	(0.169)	(0.286)	(0.385)
Proportion Bachelor's Degree or Above	-0.0691**	-0.0595*	-0.0642	-0.0514	-0.0502*	-0.0542
	(0.0239)	(0.0270)	(0.0394)	(0.0282)	(0.0246)	(0.0364)
Proportion Below Poverty Level	0.0112	0.00522	0.00258	-0.0189	0.00337	0.00173
	(0.0497)	(0.0371)	(0.0532)	(0.0306)	(0.0382)	(0.0533)
Proportion Owner Occupied Housing	0.0442*	0.0287	0.0183	0.0205	0.0260	0.0130
	(0.0219)	(0.0167)	(0.0170)	(0.0237)	(0.0160)	(0.0143)
Share of Working Age Population	0.00499	-0.0346	-0.0178	-0.0909*	-0.0323	-0.0167
	(0.0411)	(0.0428)	(0.0389)	(0.0413)	(0.0408)	(0.0372)
Log(Population)	0.295	0.0788	-0.235	0.467	0.595	0.274
	(0.756)	(0.942)	(1.426)	(0.751)	(0.997)	(1.520)
First 3 ZIP Code F.E.	No	Yes	No	Yes	Yes	No
First 4 ZIP Code F.E.	No	No	Yes	No	No	Yes
Constant	Yes	No	No	No	No	No
Observations	6919	6914	6774	6638	6914	6774
R^2	0.068	0.124	0.284	0.151	0.128	0.289

OLS Regression. Standard errors clustered by state.

* $p < .1$, ** $p < .05$, *** $p < .01$

APPENDIX

Table A1
Local ZIP Code Characteristics and Increase in Entrepreneurship.
Corporations Only

	(1) Bus. Reg 2020 – Bus. Reg. 2019	(2) Log(Bus. Reg. 2020)	(3) Log(Bus. Reg. 2020/ Bus Reg 2019)	(4) Startup Growth Ratio (Full Year) *Dropping small ZIP Codes*	(5) Startup Growth Ratio (Full Year)
Proportion non-Hispanic Black	2.877** (0.880)			0.324*** (0.0228)	0.258*** (0.0461)
Log(Proportion of Non-Hispanic Black)		0.0484** (0.0144)	0.0336** (0.0136)		
Log(Business Reg. 2019)		0.611*** (0.0416)			
Proportion Hispanic origin	0.129 (0.209)	-0.000950 (0.000959)	-0.000229 (0.000598)	0.0876** (0.0310)	0.0182 (0.0302)
Ln(Median Income)	12.45** (4.894)	0.257*** (0.0550)	0.0104 (0.0185)	-1.903 (1.718)	0.939 (0.736)
Persons per square mile	3.287*** (0.847)	0.0158* (0.00752)	0.00292 (0.00298)	0.726* (0.378)	0.132 (0.362)
Proportion Bachelor's Degree or Above	0.168 (0.275)	0.00447*** (0.00105)	-0.00332*** (0.000798)	-0.0472 (0.0249)	-0.0678** (0.0269)
Proportion Below Poverty Level	-0.854** (0.321)	0.00177* (0.000853)	0.00130 (0.000716)	-0.0995*** (0.0262)	0.0162 (0.0421)
Proportion Owner Occupied Housing	0.322 (0.174)	-0.000485 (0.000865)	-0.000355 (0.000737)	0.0360 (0.0254)	0.0483** (0.0176)
Share of Working Age Population	-0.178 (0.243)	0.000158 (0.00192)	-0.00225* (0.00108)	-0.0634 (0.0478)	-0.0144 (0.0424)
Log(Population)	5.282 (3.134)	0.138* (0.0633)	0.0291 (0.0185)	0.936 (2.008)	-0.0770 (0.771)
First 3 ZIP Code F.E.	Yes	Yes	Yes	Yes	No
MSA	No	No	No	No	Yes
Observations	6638	5610	5610	4485	6915
R^2	0.503	0.954	0.158	0.311	0.096

OLS Regression. Standard errors clustered by state.
* $p < .1$, ** $p < .05$, *** $p < .01$