

SSC442 Final Project

Ata Algan, Elizabeth Pauley, CJ Sivak

Introduction

We undertook this analysis to better understand the impacts of economic trends on the business populations of American metropolitan statistical areas (MSAs). Data on the NAICS code, number of firms total, and number of firms exited was combined with unemployment and population data to perform these analyses. Understanding how the economy of a city works on a firm level will allow a private or public group to better target financial growth incentives within their MSA. Firms may be interested in these findings as well, as they may be able to leverage existing conditions to have greater financial success. Having a large trend level view also allows for predictions to be made about how the industries and firms of a given MSA will fare in the future. These predictions will provide use for not only for stakeholders wondering what MSA they should start a business in, but also job seekers and evaluating potential opportunities in certain MSAs.

Due to the complexity of economic markets at the city level, we undertook analyses of various aspects in order to visualize snapshots of different factors on business populations. We begin by looking at the firms per capita across all NAICS sectors for each MSA. We then investigate the rate of jobs created over time for each MSA. Finally, we consider the unemployment rate and its behavior in relation to firms exiting within the last 12 months, or within the calendar year, for each MSA. Through these snapshots, we share a multifaceted look at the economic environments present in these MSAs, and present policy conclusions that can be drawn from their behavior.

Theory and Background

Theory

We were interested in the relationship between economic factors within MSAs. This included number of firms per capita, number of firms exiting, and rate of job creation. An important definition for our analysis is what is meant by “firm”. A firm is a business that can span one or more locations. Number of firms per capita will help us to understand the spread of businesses related to population. If there are few firms per capita over time, this may suggest that other systemic problems are in place preventing industry from taking hold in that MSA. Number of firms exiting will provide insight into closure of businesses, which will further inform a picture of economic health of the MSA. Businesses closing at a high rate may suggest low capital availability or high economic pressure to save due to regional or national economic trends. Rate of job creation can also give insight into firm creation and growth, which will balance and diversify our analysis of firms exiting.

Unemployment rate has a possible influence on all of these factors, since human capital is vital for most industries. However, due to modernization in many information sector businesses, unemployment rate may not track as closely with firm creation and closure as it would have historically. With respect to job creation, a high unemployment rate may prompt firm creation to fill a demand for employment over time or it may signal that a low unemployment rate is because of the constant creation of new jobs. Performing our analyses with respect to time allows us insight into these possible relationships.

We aim to answer several questions, all under the same scope:

Hypotheses

We believe that the number of firms per capita for all cities should be increasing over time.

We further believe that we will find the net rate of jobs created will be increasing in most years, and decreasing in years of recession (2008) and the pandemic (2020).

Lastly, we think we believe that the unemployment rate will increase with higher rates of firm closure. This relationship may possibly trail higher rates of firm closure by a year, due to different points of measurement from our different data sources.

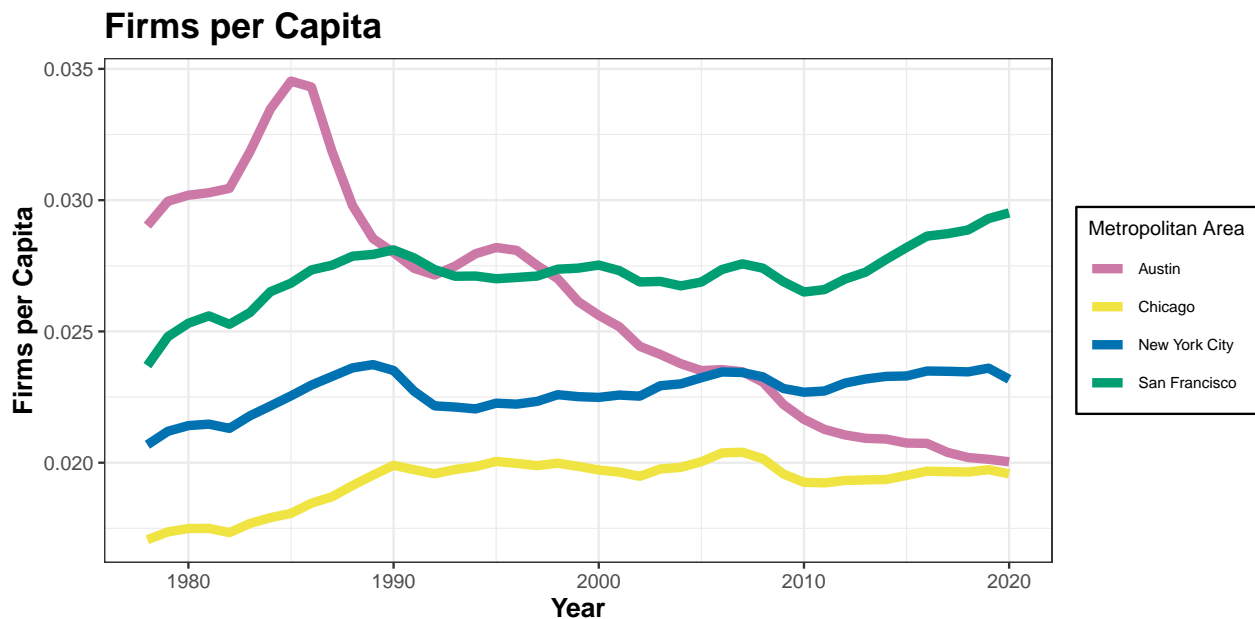
Data and Analyses

Data

Our data comes from the US Census Bureau. Based on the numerous MSAs around the nation we have selected four MSAs to analyze. The MSAs of Austin-Round Rock TX, Chicago-Naperville-Elgin IL-IN-WI, New York-Newark-Jersey City NY-NJ-PA, and San Francisco-Oakland-Hayward CA were chosen as representative of large MSAs across the country. We specifically included Austin due to its increasingly large population growth over the last 40 years, while the other cities have consistently been top MSAs since the data started. Population figures were utilized with the MSA data to calculate per capita figures for analysis. Unemployment data was obtained from the US Census Online Data Portal. For the analyses utilizing unemployment data, we were limited to 2015-2020 due to data availability.

Analyses

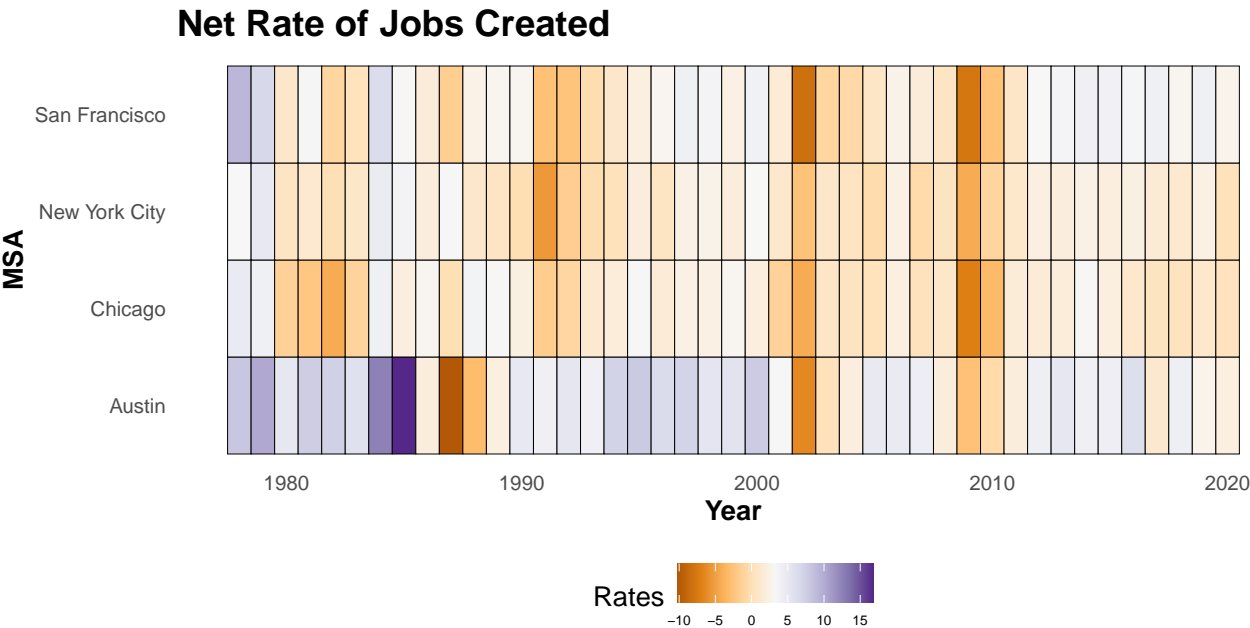
We first analyze the number of firms per capita over time by MSA. We chose to do by capita due to the vastly different population sizes of each MSA, as Austin is much smaller than New York City, despite its recent growth.



From this visualization, we see that San Francisco, New York City, and Chicago all have relatively stagnant firms per capita. On the other hand, Austin's firms per capita has been declining since they peaked in 1985.

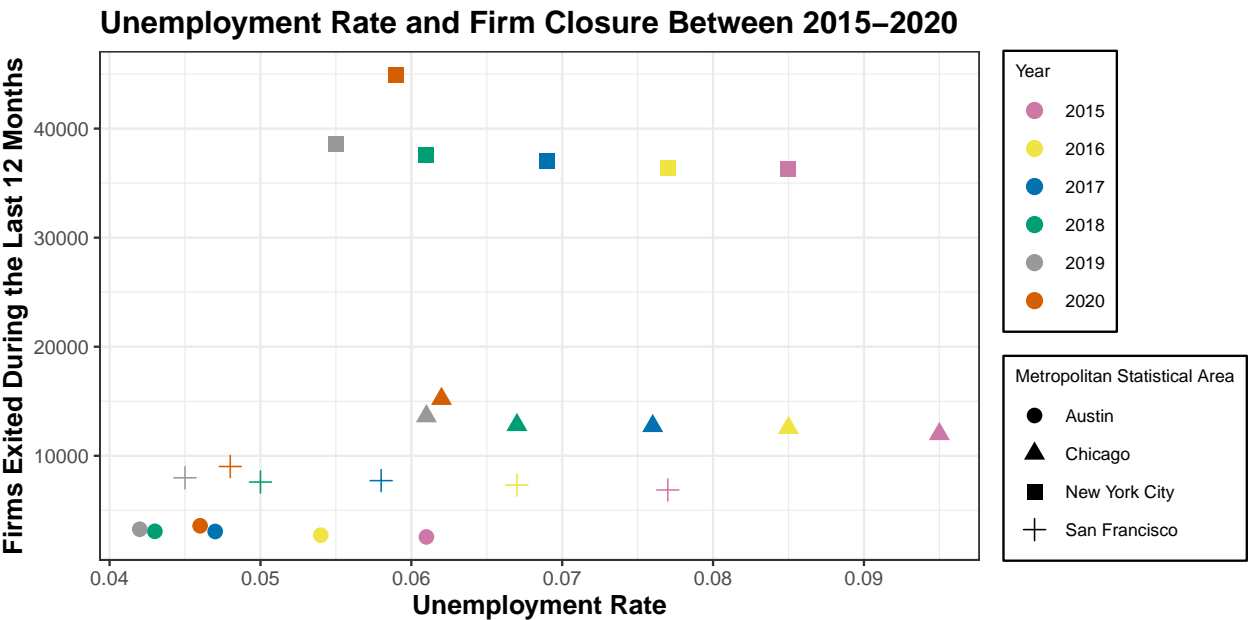
Even though we see a relatively constant firms per capita across most MSAs, it is important to look at the net rate of jobs created as well. This is due to the fact that while the number of businesses opening/closing may offset each other, firms grow more efficient over time (increasing productivity). Further, with the advancement of technology, many jobs that existed at the start of this data could be automated.

Thus, we analyze the net rate of jobs created for each of our MSAs.



We find that Austin is the only MSA with a majority positive rate, while all other MSAs rates tend to be approximately 0 or negative. This is interesting because in the previous graphic Austin was the only MSA that saw sharp decreases in the firms per capita. All MSAs were impacted by the recession in 2008, as well.

Finally, we analyze the unemployment rate of each MSA by the number of firms exiting over the last 12 months. Each point is colored by the year, and the shape of the point represents the MSA being measured.



From this visualization, we find that each of the MSA’s behaves in a similar pattern, with the rate of unemployment decreasing from 2015 to 2019 as the firms exiting within the last 12 months slightly increases. This counters our expectation that high unemployment rates would appear with high firm closure rates.

Another interesting aspect is the point for 2020 for all MSAs, shown in [INSERT COLOR HERE]. For all MSAs, it shows an increased unemployment rate from 2019, as well as an increased number of firms exiting. This is the relationship we hypothesized would occur. What is interesting is not only that it goes against the previous years of data, but that it is during the COVID-19 pandemic, which caused the same economic behavior in all MSAs, according to this visualization.

Conclusion

Based on these analyses, we recommend that action be taken to maintain human presence and interest in their city as an economic driver. Firms per capita and number of firms exited are not enough to predict economic success or failure for our MSAs, rather net rate of jobs created and the unemployment rate, as well as unique societal events like COVID-19, show that the human element to a key actor in the business populations of MSAs. Supporting quality of life within the MSA, safe and desired working conditions, and providing benefits to people living and working in these MSAs will likely support more people living, working, and creating jobs in each MSA, bringing in more money to the businesses and governments of each.