EWING MARION KAUFFMAN FOUNDATION

RESEARCH WORKING PAPER SERIES

NEW EMPLOYER BUSINESS TRENDS: A METHODOLOGICAL NOTE

Travis Howe[I] and Sameeksha Desai[I]

April 2021

ABSTRACT

New employer businesses are of interest because of their important contributions to the economy via job creation. Using a new data series from the U.S. Census Bureau – the Business Formation Statistics – and two other administrative data sources, we create four indicators (rate of new employer business actualization, rate of new employer businesses, new employer business velocity, and employer business newness) and a composite index to track the emergence and speed of new employer business, which are comparable across time and geography. The purpose of these indicators is to provide comparable measures about new employer businesses. This paper describes the methods used to create the New Employer Business Indicators used by the Kauffman Foundation.[1]

Keywords: entrepreneurship, new employer business, indicator, jobs

Acknowledgements: The authors thank Emin Dinlersoz, Robert Fairlie, Brian Headd, A.J. Herrmann, Hayden Murray, and Derek Ozkal.

[I] Ewing Marion Kauffman Foundation

[1] Python code used to fetch and transform the data and calculate the indicators is available at https://github.com/EMKF/neb. Values for the four indicators and composite index are available for years 2005-2020 at https://indicators.kauffman.org/series/newemployer.

INTRODUCTION

Individuals can engage in entrepreneurship in many ways. The creation of new employer businesses is a manifestation of entrepreneurship that plays a vital role in job creation and fuels the economy.[2]

To facilitate tracking of trends related to employer businesses, we take advantage of a new administrative data source from the U.S. Census Bureau – the Business Formation Statistics (BFS). We use data tracked by the BFS, as well as the Population Estimates Program (PEP) and Business Dynamics Statistics (BDS), to construct four indicators and a composite index at the national and state level, comparable across year and region.

The New Employer Business Indicators have been compiled in an effort to provide information on new employer businesses, a subset of all entrepreneurial activity. The series provides users with measures to estimate and track trends in the emergence of these businesses, their representation in the population and among all firms, and the time it takes these businesses to make a first payroll. The four "new employer business" indicators are: *rate of new employer business actualization,* which reflects the proportion of new business applications that become employer businesses within eight quarters; *rate of new employer businesses,* which is a population-based measure of the emergence of new employer businesses; *new employer business velocity,* which is the average amount of time for a new business application to become an employer, in quarters; and *employer business newness,* which reflects new employer businesses as a share of all employer firms. We also calculate an index that provides a snapshot of both the emergence (actualization) and speed (velocity) of new employer businesses.

Following, we discuss the background and motivation for our approach. Then we present the methodology used to construct the New Employer Business Indicators.

DATA AND METHOD

The principal data source for the construction of the employer business indicators is the Business Formation Statistics, a new dataset of the U.S. Census Bureau,[3] which provides state- and national-level data on new business applications and formations. We also use the Business Dynamics Statistics (BDS)[4] and Population Estimates Program (PEP)[5] to produce normalized estimates for two of the indicators. Data used here all come from public access data files of these programs.

"New business applications" in the BFS are applications for an employer identification number (EIN) on the IRS form SS-4. A new business application is regarded as a new employer business "formation" if it achieves a first payroll within eight quarters of EIN

[2] Haltiwanger et al., 2013.
[3] https://www.census.gov/econ/bfs/index.html
[4] https://www.census.gov/programs-surveys/bds.html
[5] https://www.census.gov/programs-surveys/popest.html

application. The BFS capture the universe of new business applications and formations based on these definitions.

BFS data are available beginning in July 2004 at a monthly frequency. The structure of the BFS data is such that the period between the EIN application and the first payroll is assigned to the month and year of the original EIN application, resulting in a lag between the time of application and when data for formations becomes available. For example, actualizations (formations) reported in 2016 include new businesses that filed an application for an EIN in 2016 and achieved a first payroll within eight quarters of filing.

The BFS provides projected data for employer formations for years beyond the observation window, which are used in the calculations of *rate of new employer business actualization*, *rate of new employer businesses*, and *employer business newness* for years 2017 through 2020. Despite the inherent uncertainty, this use of projected data allows for reasonable anticipation of trends.

BFS measures

The variables used in the calculations of the indicators include: "Business Applications," "Business Formations within Eight Quarters," and "Average Duration from Business Application to Formation within Eight Quarters." These variables are denoted below as ba_{mys}, bf_{mys}, and dur_{mys}, respectively, where m indexes the application month, y the application year, and s the region (here, U.S. or state). This indexing is consistently used in what follows. The BFS "Projected Business Formations within Eight Quarters" variable is used in the calculation of the *new employer business actualization rate*, the *rate of new employer businesses*, and *employer business newness* from 2017 through 2020.

While the BFS data have a monthly frequency, the BDS and population data are available only yearly. To compute a time-comparable set of measures, the BFS data are translated from monthly to yearly measurements. In the case of "Business Applications," the yearly values are constructed by summing the months of a given year, treating December as the end of the year. This new, yearly variable is denoted ba_{ys}:

$$ba_{ys} = \sum_{m=1}^{12} ba_{mys}.$$

Two different calculations are used, however, for yearly measurements of "Business Formations within Eight Quarters." The first calculation is constructed along the same lines as ba_{ys}, treating December as year-end and summing the months of a given year:

$$bf_{ys} = \sum_{m=1}^{12} bf_{mys}.$$

The second yearly measure of "Business Formations within Eight Quarters," denoted bf'_{ys}, instead treats March as year-end:

$$bf'_{ys} = \sum_{m=1}^{3} bf_{mys} + \sum_{m=4}^{12} bf_{m(y-1)s.}$$

Finally, a yearly measure of "Average Duration from Business Application to Formation within Eight Quarters," denoted dur_{ys}, is calculated using the following formula:

$$dur_{ys} = \frac{\sum_{m=1}^{12} dur_{mys} * bf_{mys}}{bf_{ys}}$$

Seasonally adjusted BFS data were used to create all the indicators when available.

BDS and PEP measures

The variable from the BDS used in the construction of the indicators represents the number of employer firms for the region (in this case, U.S. or state) in a given year. This variable is denoted $firms_{ys}$. As this variable is a yearly metric, no further transformation is necessary.

We use PEP estimates for population adjustment. This variable, pop_{ys}, is also a yearly metric.

Indicator calculations

Rate of new employer business actualization: The share of business applications that become employers (achieve a first payroll) within eight quarters of the application. This measure is calculated as bf_{ys}/ba_{ys}.

Rate of new employer businesses: The number of startups that become employers per 100 people. This indicator is calculated by dividing the number of business applications that become new employer firms within eight quarters by the population for a given state and year, multiplied by 100: $100 * bf_{ys}/pop_{ys}$. This produces a comparable measure across states for a given year and across years for a given state.

New employer business velocity is a measure of the speed at which new businesses become employers – the average amount of time (in quarters) that passes between the business application and the achievement of a first payroll, conditional on business formation within eight quarters. This measure is simply dur_{ys}, the annualized version of the BFS variable "Average Duration from Business Application to Formation within Eight Quarters," as described previously. This indicator is expressed in average quarters. A lower velocity value, then, indicates faster time to achieving a first payroll.

Employer business newness reflects the presence of new employer businesses among all employer firms. This is expressed as a share of all employer firms regardless of age, and it broadly reflects business dynamism tied specifically to new employer businesses.[6] The proportion of total firms within a region, for a given year, that are considered new employer firms, defined as firms that achieved their first payroll within eight quarters of the business application. This measure is calculated using two different data sources. We use the BFS data to determine the number of employer formations within eight quarters of EIN application, and we use the BDS data to determine the total number of employer firms. To calculate employer business newness, we divide the number of business applications that become new employer firms – using the first quarter year-end definition – by the total number of employer firms in a state: $bf'_{ys}/firms_{ys}$.

We use this first quarter year-end definition of the number of business applications that become new employer firms so that the BFS data are better aligned with the BDS data. The BDS report a yearly snapshot of total businesses from mid-March to mid-March. As the first quarter ends on the last day of March, there is a roughly two-week discrepancy between the timeframe for the BFS data and that for the BDS data used in the calculation of this measure. We assume this discrepancy is not significant given that the BDS measure reflects total firms, which we assume to be fairly consistent over time. The datasets track each other closely[7].

New employer business actualization speed (NEBAS) index. The NEBAS Index is calculated using the new employer business actualization rate and the new employer business velocity indicators. To calculate the Index, each of the measures is normalized using the "goal post" method,[8] in which the polarity of the actualization and velocity indicators is positive and negative, respectively, and 2005 is used as the base year and the most recent year the data is available for the velocity variable as the end year. The normalized values are then aggregated to form the Index by calculating their geometric mean. It is an equally weighted index of the two normalized indicators.

CONSIDERATIONS

Like many measures of entrepreneurial dynamics, the indicators have limitations related to sampling, interpretation and application, and reporting constraints. While no single indicator can fully capture the dynamics of new employer businesses, each indicator in this series provides insight into a specific dimension. The employer business indicators reflect dynamics specific to new employer businesses and are not more broadly reflective of all entrepreneurial activity, such as new business activity undertaken by individuals operating without employer identification numbers. They also do not account

[6] For more on employer firms and business dynamism, see Decker et al. (2014), Gourio et al. (2014), and Dvorkin and Gascon (2017); for more on nonemployers and dynamism, see Bento and Restuccia (2019).
[7] For more on the comparability of BFS and BDS, refer to https://www.census.gov/programs-surveys/bfs/technical-documentation/methodology.html#par_textimage_3.
[8] For more on the "goal post" method, see in Mazziotta and Pareto (2016), UNDP (2016: Technical Notes), and Ghislani (2019). We additionally divided by 100 to "center" each of the transformed indicators near 1.

for industry or the nature of the business activity. Also, although our focus is on new business entities which become employers, this set of indicators does not reveal detail about the quality, longevity, or other characteristics of the employment opportunities being generated. These indicators reflect the milestone of becoming an employer business, but not the number of people hired initially, or the number hired subsequently. They do not directly shed light on the size or future growth potential of the businesses which become employers.

As the BFS use an eight-quarter observation window after the business application to capture the time of the first payroll, a business that achieves a first payroll after eight quarters is not captured in the formation measure. Bayard et al (2018) show that the distribution of hiring among new businesses is concentrated in the first few quarters.[9] This may become a concern in the future as it appears that reaching a first payroll has been taking longer over time.[10] Finally, where projected data are used, it introduces the chance that some variation may be due to projecting and may be corrected in the future when the actual data become available.

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[9] Figure 2 in Bayard et al. (2018).

[10] In the United States, velocity increased from 1.43 quarters in 2005 to 2.01 quarters in 2016. See https://indicators.kauffman.org/indicator/new-employer-business-velocity.