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EARLY-STAGE ENTREPRENEURSHIP: KEY INDICATORS, SUMMARY INDEX, AND METHODOLOGY

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ABSTRACT



Entrepreneurship is a process and a series of dynamic steps, rather than a binary or static outcome. To provide more granular insights into the early stages of entrepreneurship, we elaborate on four indicators and a summary index capturing different dimensions of entrepreneurial activity within the population and within new businesses. The purpose of these indicators is to provide simple, interpretable, and comparable insight to technical and non-technical user audiences.

Keywords: entrepreneurship, indicators, early-stage, rate of new entrepreneurs, first year survival, jobs, opportunity share

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INTRODUCTION

Substantial interest in entrepreneurship among policymakers at the federal, state, and local levels; program managers at nonprofits and community organizations; investors and banks; and others highlights the need for accessible and interpretable measures of entrepreneurship.

However, measuring entrepreneurship is a challenge for several reasons. First, whereas many approaches treat entrepreneurship as a binary, static activity – such as start / don't start a business, or own / don't own a business – it is actually a dynamic process or a "journey" (Bennett and Chatterji, 2019) that may be characterized by different needs and challenges at different stages of the process (Looze and Desai, 2020). We therefore narrow our approach in measuring early-stage entrepreneurship activity to focus within the first year of this journey.



Second, "entrepreneurship" is actually a catch-all descriptor of new business activity, which is the phenomenon of interest. New business entities are an important, but not the only, manifestation of entrepreneurship. For example, many entrepreneurs operate as unincorporated self-employed, which means that any entity-based measure would leave them out. Some such entrepreneurs may operate this way but decide to incorporate the business in the future – and some may remain unincorporated self-employed entrepreneurs for the length of their activity. At the same time, many dynamics of interest are, by nature, related to entities, such as job creation. Our approach, therefore, is to take a broad view of entrepreneurial activity and to consider entrepreneurship both as something that occurs at the level of the person and the level of a business entity.

Third, creating indicators for broad use by audiences that include non-technical users requires considering user needs. We took several considerations into account based on feedback from a wide range of users interested in applying data to inform their understanding of entrepreneurship and their considerations for decision making.¹ A driving factor is the need to create "modular" style indicators that allow users to hone in on a specific metric that can stand alone, and to examine them together for a big picture view.

We, therefore, prioritized several goals when creating indicators. To provide value for users tasked with making decisions about entrepreneurship, a series of indicators should focus narrowly on a specific dimension. This increases the level of granularity and nuance visible to the user. We, therefore, focus on metrics within the first year to capture an early part of the entrepreneurship journey. At the same time, a series of indicators should appropriately allow for the realistic heterogeneity of entrepreneurship (Dilli et al., 2018). While no single indicator can provide a complete picture of all types of

¹ These indicators were informed by feedback from nonprofits and community organizations, policymakers, researchers, internal staff, and the media. Two of the indicators – the rate of new entrepreneurs (year) and opportunity share of new entrepreneurs (year) – were created by Fairlie and continue as part of this series. Two new indicators – startup early job creation and startup early survival rate – were developed to provide entity-based metrics to round out this series.

entrepreneurial activity at any given time, our approach considers that entrepreneurship is both about people (who decide to start a business) and businesses. We also prioritized selection of indicators for inclusion in the series that also be viewed collectively in a summary index for a big picture overview. Finally, we use underlying data that have timely release where possible, instead of lags, in order to enhance immediacy of application for decision making.

This paper lays out the approach used to create a series of four standalone indicators on early-stage entrepreneurship as well as a comprehensive summary index. These measures form the Kauffman Indicators of Early-Stage Entrepreneurship.²

DATA SOURCES



Two data sources are the primary sources for the indicators. A special panel dataset created from the Current Population Survey (CPS) is used to construct the indicators that aggregate individual- or person-level entrepreneurial activity. This is the source for the rate of new entrepreneurs and opportunity share of new entrepreneurs. The CPS is a monthly survey of approximately 60,000 households and is the official source used to calculate the household-based measure of the unemployment rate by the U.S. Bureau of Labor Statistics. These surveys, conducted monthly by the U.S. Census Bureau and the U.S. Bureau of Labor Statistics, represent the entire U.S. population and contain observations for more than 130,000 people each month. The survey primarily asks questions focused on the employment status of household members, including whether they are unemployed, out of labor force, wage/salary worker, or a business owner.³

The special panel dataset matches the basic monthly files of the CPS over time. By linking the CPS files over time, longitudinal data are created, allowing for the examination of month-to-month changes in business creation. Combining the monthly files creates a sample size of roughly 700,000 adults ages 20 to 64 each year. The CPS microdata capture all business owners, including those who own incorporated or unincorporated businesses, and those who are employers or non-employers, and can identify changes to a respondent's main job. This method of creating panel data takes advantage of the household surveying strategies used for the CPS. Households in the CPS are interviewed each month over a four-month period. Eight months later, they are re-interviewed in each month of a second four-month period. Thus, individuals who are interviewed in January, February, March, and April of one year are interviewed again in January, February, March, and April of the following year. The CPS rotation pattern makes it possible to match information on individuals monthly and, therefore, to create two-month panel data for up to 75 percent of all CPS respondents. To match these data, the household and individual identifiers provided by the CPS are used. False matches are removed by comparing race, sex, and age codes from the two months of data. After removing all non-unique matches, the underlying CPS data are checked extensively for coding errors and other problems.

² The early-stage indicators, summary reports and data downloads are available on indicators.kauffman.org.

³ See https://www.census.gov/programs-surveys/cps.html.

Monthly match rates are generally between 94 percent and 96 percent. Household moves are the primary reason for non-matching. A somewhat non-random sample (mainly geographic movers) will, therefore, be lost due to the matching routine. Moves do not appear to create a serious problem for month-to-month matches, however, because the observable characteristics of the original sample and the matched sample are very similar.

The CPS sample was designed to produce national and state estimates of the unemployment rate and additional labor force characteristics of the civilian, non-institutional population ages 16 and older.⁴ The total national sample size is drawn to ensure a high level of precision for the monthly national unemployment rate. For each of the 50 states and the District of Columbia, the sample also is designed to guarantee precise estimates of average annual unemployment rates, resulting in varying sample rates by state.⁵ Sampling weights provided by the CPS, which also adjust for non-response and post-stratification raking, are used for all national and state-level estimates.

The Business Employment Dynamics (BED) series, from the U.S. Department of Labor, is the source for the startup early job creation and startup early survival rate indicators. The BED is derived from the Quarterly Census of Employment and Wages (QCEW), or ES-202, program. The data include all establishments subject to state unemployment insurance (UI) laws and federal agencies subject to the Unemployment Compensation for Federal Employees program. It covers all employer establishments in the United States – approximately 7.5 million.

The BED data include numbers of businesses tabulated by firm age, establishment age, employment size, and geography (national and state). Firm age information is used to identify and measure the number of startups, defined as employer businesses younger than one year old.

Because the BED is based on underlying administrative data that covers the universe of employer establishments, sampling concerns like standard errors and confidence intervals are irrelevant. Nonetheless, non-sampling errors still could occur. These could be caused, for example, by data entry issues or by businesses submitting incorrect employment data.

We create four standalone indicators and a summary index that, when viewed as a series, provide insights into dimensions of early-stage entrepreneurship. The indicators are the rate of new entrepreneurs, opportunity share of new entrepreneurs, startup early job creation, and startup early survival rate. The summary early-stage entrepreneurship index evenly weights contributions from the four indicators.



⁴ The civilian non-institutional population is defined as persons 16 years of age and older residing in the 50 states and the District of Columbia, who are not inmates of institutions (e.g., penal and mental facilities, homes for the aged), and who are not on active duty in the Armed Forces. This number is reported regularly by the Federal Reserve and is available here: https://fred.stlouisfed.org/series/CNP16OV. ⁵ See Polivka (2000).

Each of the indicators is based on either a nationally representative sample of more than a half-million observations each year (using CPS data), or the universe of new employer businesses or new employer establishments in the United States (using BED data) (roughly 400,000 new employer businesses and 650,000 new employer establishments each year). These datasets allow for an examination of entrepreneurs and the earlystage startups that they create. For all the indicators, the underlying definitions and methodology are the same for national and state estimates, with appropriate adjustments for geography and population size by state.

EARLY-STAGE INDICATORS

Rate of new entrepreneurs



The rate of new entrepreneurs captures the percentage of the adult, non-business owner population that starts a business each month. New business owners are defined here as those individuals who work an average of 15 or more hours per week in their businesses in the preceding month.⁶ To create the rate of new entrepreneurs all individuals who do not own a business as their main job are identified in the first survey month. By matching monthly CPS files, it is then determined if these individuals own a business as their main job are measured accurately because CPS survey takers ask whether the individual has the same main job that they reported in the previous month. If yes, the interviewer carries forward job information, including business ownership, from the previous month's survey. If no, the respondent is asked the full series of job-related questions. Survey-takers ask this question at the beginning of the job section to save time during the interview process and improve consistency in reporting.

The main job is defined as the job with the most hours worked. Individuals who start side businesses will, therefore, not be counted if they are working more hours on a wage/salary job. The requirement that business owners work 15 or more hours per week in the second month is imposed to rule out part-time business owners and very small business activities. The rate of new entrepreneurs may, therefore, underestimate or overestimate the percent of individuals creating any type of business.

⁶ Note that estimates of annual business creation rates would be approximately six to eight times higher, not twelve times higher than monthly rates, because individuals potentially can enter and leave business ownership at multiple times within the same year. For example, an individual with a sole proprietorship might work more than 15 hours a week during one month, showing up as a new entrepreneur, then be unable to find a new project for that business for several months, taking a seasonal position as an employee of another business during that time. Later in the year, the individual may find a new project which enables them to activate the business and work more than 15 hours in a subsequent month. This individual would show up twice in the data, though the business is the same from an ownership point of view. Yearly figures reported for the rate of new entrepreneurs are averages of the monthly rate.

The rate of new entrepreneurs provides a broad measure of entrepreneurship, capturing all new business owners, including those who own incorporated or unincorporated businesses, and those who are employers or non-employers.⁷

The rate of new entrepreneurs excludes individuals who owned a business and worked fewer than 15 hours in the first survey month. Thus, it does not capture business owners who increased their hours from less than 15 per week in one month to 15 or more hours per week in the second month. It also does not capture when they changed from being non-business owners to business owners with less than 15 hours worked. These individuals are excluded from the sample but may actually have been at the earliest stages of starting a business. At the same time, the rate of new entrepreneurs may overstate entrepreneurship because of how individuals report their work status. Longstanding business owners who are also salaried in the business may, for example, not report that business ownership is their main job if their wage/salary jobs had more hours in that particular month. If these individuals later report having worked more hours in business ownership in a subsequent month, it would appear that a new business had been created.

For the rate of new entrepreneurs calculations presented in this report, all observations from the CPS with allocated labor force status, class of worker, and hours worked variables are excluded. The rate of new entrepreneurs is substantially higher for allocated or imputed observations.

Calculating Rates

To calculate the national and state rates of new entrepreneurs reported in the published reports upload the original microdata from

<u>https://people.ucsc.edu/~rfairlie/data/microdata/</u>. The key variable is *ent015ua* which has missing values that need to be removed from the sample. Sample weights, *wgtat1*, need to be used to make estimates representative of the population.⁸ In the published reports, all state-level measures of the rate of new entrepreneurs are calculated as a 3-year trailing average (e.g. the 2000 rate is the average of the 1998, 1999, and 2000 rates).

Opportunity share of new entrepreneurs

The opportunity share of new entrepreneurs reflects the percent of the total number of new entrepreneurs who were not unemployed as they started the new business. Using the same data for the rate of new entrepreneurs in the CPS panel, it considers individuals' initial labor market status in the first survey month.



⁷ Most self-employed business owners are non-employers, but about 1 million self-employed business owners are classified as employer businesses. See

https://www.census.gov/epcd/nonemployer/view/define.html.

⁸ The equation for weighting is the following: $\sum (ent015ua_i *wgtat1_i) / \sum (wgtat1_i) *100$, where *i* is an individual in a month (i.e., a row in the dataset). Most statistical software packages allow the user to add a sample weight as an option when calculating various statistics and functions such as means or regressions.

The opportunity share of new entrepreneurs is rooted in the idea that some individuals will be opportunity entrepreneurs that choose entrepreneurship, including those coming out of work, school, or other labor market status, and some individuals will be necessity entrepreneurs to avoid unemployment. The distinction between opportunity versus necessity has been discussed extensively in the entrepreneurship literature (Desai, 2017; Fairlie and Fossen, 2017). It is conceptually useful because the motivations for starting a business could influence the type, nature, and future direction of the business; it is also meaningful because it reflects to some extent the landscape of economic opportunity for entrepreneurs. Although there is some convergence about the theoretical distinction between the two motivations for business creation, a clean distinction is difficult to make with empirical data. It is important to note that although the motivations for starting businesses can differ (Kauffman Foundation, 2020) and can be in the context of weak economic conditions and high unemployment rates, necessity businesses could eventually become very successful (Fairlie et al., 2019; Fairlie, 2011; Block and Sandner, 2009; Hinz and Junhauer-Gans, 2010; Caliendo and Kritikos, 2010).



Distinguishing between opportunity and necessity entrepreneurship using prior labor market status offers broad insight into the influence of economic conditions on overall business creation among new entrepreneurs. The opportunity share of new entrepreneurs generally increases when economic conditions are improving and decreases when economic conditions are worsening.

Calculating Rates

To calculate the national and state opportunity share of new entrepreneurs reported in the published reports upload the original microdata from: <u>https://people.ucsc.edu/~rfairlie/data/microdata/</u>. The key variable is *oppshare* which has missing and non-applicable values that need to be removed from the sample.⁹ Sample weights, *wgtat1*, need to be used to make estimates representative of the population.¹⁰ In the published reports, all state-level measures of the rate of new entrepreneurs are calculated as a 3-year trailing average (e.g. the 2000 rate is the average of the 1998, 1999, and 2000 rates). In addition, all national-level measures of the the rate of new entrepreneurs except the total are calculated as a 3-year trailing average.

Startup early job creation

Startup early job creation uses BED data to capture early-stage job creation among startup cohorts each year. It reflects total employment created by new employer firms in

⁹ The variable, *oppshare*, is only defined for new entrepreneurs, and thus has missing values for non new entrepreneurs.

¹⁰ The equation for weighting is the following: $\sum (oppshare_i^*wgtat1_i)/\sum (wgtat1_i)^*100$, where *i* is an individual in a month (i.e., a row in the dataset). Most statistical software packages allow the user to add a sample weight as an option when calculating various statistics and functions such as means or regressions.

their first year for every 1,000 people, meaning that it is a measure of average first year job creation by a startup, and it is comparable across time and by geography.

This indicator is an annual measure and uses startups defined as new employer establishments that are younger than one year old in a given year. The total employment generated by these startups in their first year is normalized by the population to create the per capita startup early job creation measure. To focus on early-stage business success, a one-year window is used to measure job creation. Population data is obtained from the U.S. Census Bureau.

Focusing on only the quantity of employer startups or the average number of jobs created per startup alone would not capture the potential of startups for early job creation. Startup early job creation reflects job creation power of a typical startup within the first year. This is also appropriate to understand entrepreneurial job creation because the majority of new businesses that ever become employers will do so within the first year (Bayard et al., 2018). This indicator does not reflect dimensions of job quality, such as compensation or longevity, which can be important characteristics (Burton et al., 2016), and it doesn't reflect industry.

Calculating Rates

To calculate the national and state startup early survival rates reported in the published reports the first step is to download data from Table 1.B.F at: <u>https://www.bls.gov/bdm/business-employment-dynamics-data-by-age-and-size.htm</u>. These data provide the total number of jobs created by new firms.¹¹

The second step is to download population estimate data from the U.S. Census Bureau at: <u>https://www.census.gov/programs-surveys/popest/data/tables.html</u>. Population estimates are updated periodically by the Census Bureau and denoted by vintage years. These vintage years include all years since the most recent decennial census and the latest vintage of data available supersedes all previously-produced estimates for those dates. In other words, with each new annual release of the data, the complete time series of estimates is revised back to the last census.For example, the vintage 2019 tables include the latest estimates of population for 2010 to 2019 (as of 2019) and replace estimates for all of these years from previous vintages. The data are based on intercensal July estimates of the population. Estimates for 2020 and 2021 are based on the 2020 Census.

Population estimates for the following years are dowloaded from:¹² 2020 and 2021: <u>https://www.census.gov/data/tables/time-series/demo/popest/2020s-state-total.html</u>



¹¹ The table used is: i) Industry: Total Private, ii) Age group: Less than one year old, and iii) Size class: All sizes.

¹² Population estimates for all years can be found at: https://www.census.gov/programssurveys/popest/data/tables.html

2010 to 2019: <u>https://www.census.gov/data/tables/time-series/demo/popest/2010s-state-total.html</u> 2000 to 2009: <u>https://www.census.gov/data/tables/time-series/demo/popest/intercensal-2000-2010-state.html</u> 1996 to 1999: <u>https://www2.census.gov/programs-surveys/popest/tables/1990-</u>2000/intercensal/st-co/co-est2001-12-00.pdf

Startup early job creation is calculated by dividing the number of jobs created by new firms by the population. The measure is adjusted to measure jobs per 1000 people.¹³

Startup early survival rate

As with the previous indicator, the startup early survival rate uses BED data to measure the percentage of new employer establishments that survive their first year of operation. It is calculated as the percentage of new employer establishments that are still active after one year of operation.

This indicator measures the early survival rates of new establishments rather than new firms. A firm is an establishment (when it is a single entity that is independent) or can be a combination of several establishments (Sadeghi et al, 2016). For example, a new location of a service-oriented business (such as a restaurant or gas station) would count as a new establishment but not as a new firm. Historically, the establishment first-year survival rate has been very similar to the firm first-year survival rate (U.S. Bureau of Labor Statistics, 2015).

Startup early survival rate is cut off at one year and is, thus, a measure of immediate survival. It does not reflect the long-term survival of a startup.

Calculating Rates

To calculate the national and state startup early survival rates reported in the published reports download data from Table 7 at <u>https://www.bls.gov/bdm/bdmage.htm#national</u>. For each year, the startup early surival rate is calculated by dividing the number of surviving establishments the following year by the number of annual openings that year.¹⁴

Summary index



¹³ The equation for startup early job creation is the following: sjc = jobs/(pop/1000) where jobs is the number of jobs created by new firms and pop is the population.

¹⁴ To calculate the startup survival rate in year t, the count of surviving establishments in year t+1, determined by the variable survival_since_birth for establishments age=1, is divided by the count of annual openings in year t.

The four indicators described above are standalone metrics that each provide insight on a specific dimension of early-stage entrepreneurship. Using these indicators, we also calculate a summary early-stage entrepreneurship index to provide a measure of overall trends in early-stage entrepreneurship over time. The index equally weights the four normalized indicators.

For comparability across measures, each measure is normalized by creating a Z-score for the variable. The Z-score for each measure subtracts the mean and divides by the standard deviation. To calculate the mean and standard deviation for each measure, national annual estimates of the mean and standard deviation across the first two decades of available data (1996 to 2015) are used.¹⁵ The time period is used because it covers two business cycles (starting at the midpoint of the 1990s growth period). The same normalization method, which is based on national annual data, is used for both geographic levels – national and state – for comparability and consistency over time.



The index is the arithmetic mean of the four indicators and is centered at 0. To normalize the standard deviation of the index to 1 the index is multiplied by 2. Values greater (lower) than 0 indicate values greater (lower) than the first two-decade average of the index. In some cases, an index score may be driven by one very high or low indicator.

CONCLUSION

The early-stage entrepreneurship indicators described in this paper are a set of measures that represents new business creation in the United States, integrating several high-quality, timely sources of information.

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¹⁵ Note that this calculation uses 1996-2015 to calculate the mean. The time period is fixed focusing on a time period that covers two business cycles. This is an update to Fairlie et al. (2018, 2019), which uses all years to calculate the mean (in other words, the index for the year 2018 would have used 1996 to 2018). This update changes the base for the index by three out of twenty years; estimates using the full time period from 1995 to 2019 to calculate the means for the Z-scores are similar, as expected.

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