

Kabbage Small Business Revenue Index

Methodology

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Foreword

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Recent research in the academic literature indicates that US business dynamism has declined in the past few decades, and especially since 2000.^{1,2} This decline is evident both in lower rates of business startups and in the number of workers employed by young firms. Indeed, the share of US employment accounted for by firms less than five years old has shrunk by almost a third since the 1980s.

Unfortunately, publicly available data useful for studying small business activity are scarce. By publishing the Small Business Revenue Index, Kabbage hopes to promote research into these firms, as well as greater understanding of the factors that promote and inhibit entrepreneurial activity. These data are particularly useful along those lines for a number of reasons. First, they track a sample of firms that are very small in terms of both revenue and employees, potentially permitting analysts to observe firms at their earliest stages of development. Second, they are unique in tracking firm revenues via banking activity rather than as responses to census or survey questionnaires. Finally, these firms can be tracked along both industry and geography dimensions, potentially providing an early signal of emerging entrepreneurial trends.

We have designed this methods memo to make the construction of Kabbage's index as transparent as possible. Going forward, we welcome suggestions as to how to make these data even more useful.

- Dr. Peter Schott

¹ Decker, Ryan, John Haltiwanger, Ron Jarmin, and Javier Miranda. 2014. "The Role of Entrepreneurship in US Job Creation and Economic Dynamism." *Journal of Economic Perspectives*, 28 (3): 3-24.
<https://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.28.3.3>

² Decker, Ryan A., John Haltiwanger, Ron S. Jarmin and Javier Miranda. 2017. "Declining Dynamism, Allocative Efficiency, and the Productivity Slowdown." *American Economic Review*, 107(5):322-26.

Introduction

Kabbage Small Business Revenue Index

The Kabbage Small Business Revenue Index (the Index) is designed to measure the ongoing revenue trends of U.S. small businesses by drawing from the two million live data connections Kabbage maintains across more than 200,000 small businesses.

The Index indicates the ongoing revenue trends among a segment of businesses whose aggregated analysis of live financial data have historically been unavailable for public consumption and research. The majority of the businesses recognized in the Index have fewer than 10 employees (83%), all have been in business for at least one year, and had a median annual revenue of \$280,000 in 2018. As small businesses represent 99 percent of businesses and nearly 50% of all jobs and the non-agricultural GDP in the U.S.—the Kabbage Small Business Revenue Index is an approximated view into the financial growth of the businesses with a sizable effect on national and local economies.³

The Index is a rules-based calculation which provides an overall small business revenue Index, state-based indices, and for specific industries. As an aid to the transparency of the Index, this document sets out the rules that govern the Index, its calculation and management procedures, including the various formulae used to define and calculate revenue growth and other relevant statistics.

Eligibility Criteria

The Index is an aggregate analysis of the financial data from U.S. small businesses who have permissioned data connectivity to Kabbage. Calculated on a monthly basis, the Index applies filters to analyze only the businesses with continued data connectivity to ensure data recency and track the revenue growth of a small business (SMB) over.

Eligibility Filters

To be included in the sample used for a monthly Index calculation, the following criteria must all be satisfied:

- The small business has granted Kabbage permission to access at least one verified business bank account on or after January 2015.

³ “Small Business GDP: Update 2002-2010,” U.S. Small Business Administration, 2012, https://www.sba.gov/sites/default/files/rs390tot_1.pdf;
“2018 Small Business Profile,” U.S. Small Business Administration Office of Advocacy, 2018, <https://www.sba.gov/sites/default/files/advocacy/2018-Small-Business-Profiles-US.pdf>

- Connected bank accounts must show a preset minimum level of activity every subsequent month to be considered informative. Minimum activity thresholds are defined as:
 - Observing a minimum of 10 credit transactions or more in the connected account over the last 60 days from the observation date.
 - Having a minimum MRE of \$3,000 (MRE is defined in a later section).
 - A credit transaction occurred on greater than 25% of the days in a month.
- If connectivity to an account is lost at any time or no longer meet the minimum activity required, the small business associated with the account(s) is discarded from the Index calculation for that period. If connectivity to the account(s) is regained at any time, the business will be re-included in the Index.

Index Construction Methodology

Definition

The Index defines revenue as the median revenue growth of U.S. small businesses. As there is wide variance in how every business recognizes revenue, Kabbage analyzes the record of transactions observed in the connected bank accounts to which its granted access to estimate monthly revenue.⁴

Kabbage experimented with several definitions of estimating revenue from the available data. The most straightforward technique is a Median Revenue Estimate (MRE).^{5,6} This is calculated as: MRE over time period (t)—in this case the 60 days prior to the end of the month—for an account (i) is the product of number of credit transactions observed times the median credit transaction amount in that same period.

$$(1) \quad MRE_{(i,t)} = \# \text{ of Credit Transaction}_{(i,t)} * \text{Median Credit Transaction Amount}_{(i,t)}$$

If a customer has multiple connected bank accounts over a time period (t), the total revenue is defined as the max MRE over all connected accounts that pass the minimum activity filter.

⁴ Kabbage is restricted to the accounts it's granted access, which may not fully reflect the complete revenue bookings of the businesses evaluated in the Index. Further, bank accounts only record transactions as they are realized, not as they are booked. (i.e. cashflow basis as opposed to accrual basis.) This may imply a lag in observing business growth as recognized by general accounting principles.

⁵ Mean Revenue Estimate was also considered as an alternative to Median Revenue Estimate proposed above. However, since mean as a measure of center is susceptible to outliers, median was preferred for the Index construction.

⁶ MRE is a proprietary calculation designed for the Index. MRE as defined in the Index is not used in the underwriting methods for the *Kabbage* platform.

Computing Growth

In order to calculate small business growth from revenue, a monthly rate of change is calculated for each small business.

$$(2) \quad Growth_{(t)} = \frac{MRE_{(t)}}{MRE_{(t-1)}} - 1$$

From a composite population of each businesses' growth rate, the median growth in a population is reported every month as the overall population growth rate.⁷ Therefore, the Index for any population is calculated as:

$$(3) \quad Index\ Value_{(t)} = Index_{(t-1)} * (1 + Median\ Growth_{(t)})$$

Industry Adjusted Weighting

The specific mix of Kabbage customers may not be representative of the overall U.S. SMB landscape. In order to create an overall U.S. SMB index, the overall representation of Kabbage businesses by industry must be equal to that of the overall U.S. SMB landscape. To account for this, the Index approach is modified to compute one index per industry, with each SMB being assigned a mutually exclusive industry.⁸ Industry is identified by the 2-digit industry code that is obtained from U.S. Census NAICS classification system.⁹ The industry groupings are:

Industry Description	Two-Digit NAICS
Agriculture, Mining, Utilities	11, 21, 22
Construction	23
Manufacturing	31–33
Wholesale Trade	42
Retail Trade	44–45
Transportation and Warehousing	48–49
Information	51
Finance, insurance, real estate, rental, and leasing	52–53
Professional and business services	54–56
Educational Services	61
Health Care and Social Assistance	62
Arts, Entertainment, and Recreation	71
Accommodation and Food Services	72
Other Services	81, 92, Unidentified

Figure 1

⁷ Given the large fluctuations that can occur on a month-to-month basis in small business revenues, median was again applied to diminish the susceptibility to outliers.

⁸ The industry of each business is assigned by a third-party data provider at the time of approval for each customer.

⁹ NAICS: The North American Industry Classification System

Once industry specific indices are computed, they are weighted by the percentage of each industry representation in the overall U.S. SMB landscape to arrive at a U.S.-representative calculation for the Kabbage Small Business Revenue Index. The indices will be weighted according to the total firm data from the Small Business Administration (SBA).¹⁰ For Index values prior to the initial publication of the Index, the actual industry weights from a given year will be applied. The most recently available SBA data will be used as available and on an ongoing basis. At time of writing, the Index employed results from 2016.

Index Reconstruction

After evaluating small businesses based on industry, the Index is constructed. The Index is normalized with a Kabbage Index Value (KIV) of 100 beginning on January 2017. Each month, the MRE growth rate is applied to the previous month's Kabbage Index Value. This process is followed for all accounts with industry data across each industry in Figure 1.¹¹

Index by State

An identical approach to the one described above for industries is followed to analyze trends by U.S. state. State-wide indices are not used in the calculation of the overall Index but provide additional insights on a state basis.

Timing of Changes

Three versions of the most-recent Index values per month will be categorized as: "Preliminary", "Revised", and "Final". These versions will be published one month after another and automatically updated in the Index values, and are represented as dotted lines on the live, interactive tool on Kabbage.com. For example, the "Preliminary" number for March will be published in April, the "Revised" number published in May, and the "Final" number published in June. The purpose is to allow the Index to aggregate the appropriate data from the cohorts analyzed in each Index observation. This helps account for the variance in small businesses payments, including those invoicing with net 30-, 60- or 90-day terms.

¹⁰ Industry based re-weighting will be applied annually using updated SBA.

"United States Small Business Profile, 2016", U.S. Small Business Administration Office of Advocacy, 2017, https://www.sba.gov/sites/default/files/advocacy/United_States.pdf;

"United States Small Business Profile, 2017", U.S. Small Business Administration Office of Advocacy, 2018, https://www.sba.gov/sites/default/files/advocacy/All_States_0.pdf;

"United States Small Business Profile, 2018", U.S. Small Business Administration Office of Advocacy, 2019, <https://www.sba.gov/sites/default/files/advocacy/2018-Small-Business-Profiles-US.pdf>.

¹¹ For all industry and state groupings, a sample size threshold was considered in order to be included in the Index. The sample size threshold is being monitored in ongoing Index calculations.

Index Committee

The Kabbage Index Committee¹² was formed for third-party experts to analyze and review the overall methodology and outputs of the Kabbage Index. The Index Committee's primary functions include reviewing the analysis, ensuring calculations are sound, addressing and resolving data biases, as well as providing expertise and insight into the ongoing trends of small business revenue growth.

¹² Expertise and insights from the Kabbage Index Committee will be provided as available. Kabbage and the Index Committee reserve the right to exercise discretion when necessary.