

2016 THE KAUFFMAN
INDEX

growth entrepreneurship

NATIONAL TRENDS

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Foreword

By Steve Case

Chairman and CEO, Revolution LLC

Co-Founder, America Online

We are entering a new chapter in the history of the economy. Growth entrepreneurship, which is the subject of this report and has always been important for jobs, innovation, and wealth creation, is about to revolutionize real-world sectors as entrepreneurs leverage new internet technologies.

In my new book, the *Third Wave*, I predict that entrepreneurs are on the cusp of rapidly transforming healthcare, education, food, and transportation—even the very nature of work itself. Of all the factors contributing to this looming entrepreneurial renaissance (one that will require corporate leaders to develop a perpetual sense of paranoia and curiosity, and policymakers to rethink how they approach economic issues), there are two I want to highlight: 1) why the Third Wave will be dramatically different and more consequential, and 2) why we have to take note of the emergence of the Rise of the Rest.

The Third Wave

The First Wave took place from 1985 to around 1999. It was about building the

infrastructure for an online world. Companies like AOL, Cisco, IBM, Apple, Sprint, and Sun Microsystems built the hardware, software, and networks that would make it possible to connect people to the internet. We were constructing the on-ramps to the information superhighway. (Remember that term?) It wasn't easy: When AOL launched, 3 percent of people were online, and for one hour per week! But we grinded away, and by the turn of the century, when AOL and Time Warner merged, we had literally gotten America Online.

The Second Wave, from 2000 through 2015, was about building on top of the internet. Search engines like Google made it easier to explore the sheer volume of information; Amazon and eBay created one-stop shopping; social networks like Facebook let us organize ourselves—and attracted a billion users. Apple and Google helped usher in the mobile revolution leading to millions of mobile apps. The Second Wave was defined by software as a service—social apps like Twitter, Snapchat, and Instagram make sharing ideas and photos easier, or traffic apps like Waze, which weren't practical without ubiquitous mobile connectivity, help us get around.

At this moment the Second Wave is giving way to something more consequential: the Third Wave. The Third Wave is the era when the internet stops belonging to internet companies. It is the era when the term “internet-enabled” will start to sound as ludicrous as the term “electricity-enabled.” The biggest industries in the world that most affect our daily lives will finally be disrupted (and improved) as entrepreneurs are finally able to leverage the *internet-of-everything*: Healthcare, Education, Food, Transportation, and Energy.

Much will change: work as we know it—what it means to get a job—will be redefined. Policymakers will have no choice but to

modernize laws and regulatory regimes to support innovation, and protect a new class of workers, or be at risk of falling behind to competitor nations. Iconic corporations will face existential crises faster than they realize. The Third Wave is when the vast potential of the internet will finally be realized—especially for growth entrepreneurship.

The Rise of the Rest

Over the last few years I've traveled 4,000 miles by bus on Revolutions' "Rise of the Rest" road trips where we met with talented innovators in cities and towns across the country. I'm convinced that the coming of the Third Wave will be closely linked to what I refer to as "the rise of the rest." In the following decades we will see cities that were previously in the margins of growth entrepreneurship rise up and become entrepreneurial powerhouses.

It's worth remembering that 75 years ago Silicon Valley was little more than an apple orchard, while Detroit was one of the most innovative and prosperous places in the country. Cities rise, and they fall.

In recent years, if an entrepreneur wanted to start a software company, he or she would probably be better off by moving to Silicon Valley or Boston. That's changing. In the Third Wave, entrepreneurs will benefit from being close to the industry ecosystems they want to revolutionize. A startup wanting to revolutionize agriculture may find fertile ground in the Midwest. A company looking to disrupt healthcare may want to settle in Nashville. And, indeed, this is what the inaugural Kauffman Index of Growth Entrepreneurship shows, with the "expected" hubs of Boston, San Francisco, and San Jose doing well, but with the rise of the rest bringing about a new wave of growth entrepreneurship throughout all regions of the United States.

Barriers to entry have fallen significantly, especially for technology companies, making it less costly to start and scale a company. Public policy reforms, including the JOBS Act, which legalized equity crowdfunding, is increasing access to capital. There's a consensus, finally, among local leaders that creating the conditions for startups to scale is critical. In the Third Wave, I expect this trend to accelerate.

Growth Entrepreneurship

Growth entrepreneurship affects all of us. Nonetheless, certain groups should be paying special attention to the Growth Entrepreneurship Index. First, policymakers, who can leverage the data here to better understand what is happening in their cities, states, and the country. Second, entrepreneurial supporters—no matter if they are an accelerator in the Midwest, a venture capitalist in Silicon Valley, or an economic development agency in the East Coast. The data here give new benchmarks of growth outcomes you've not had access to previously. The third, and most important group, is entrepreneurs looking to start Third Wave companies. The data in this report should assure you that growth entrepreneurship is possible anywhere in the United States and in any industry. Third Wave entrepreneurs will be farmers, factory workers, chefs, and artists; and they often will bring innovation to the industries and cities they are already in.

The Kauffman Foundation brings a powerful suite of data and research tools to help us understand growth entrepreneurship. Together, these three groups of entrepreneurs, entrepreneurship supporters, and policymakers can use these tools to help bring about the next generation of entrepreneurship ecosystems in the United States.



About the Kauffman Index of Entrepreneurship Series

The Kauffman Index of Entrepreneurship series is an umbrella of annual reports that measures U.S. entrepreneurship across national, state, and metro levels. Rather than focusing on inputs, the Kauffman Index focuses primarily on entrepreneurial outputs—the actual results of entrepreneurial activity, such as new companies, business density, and growth rates. The Kauffman Index series consists of three in-depth studies—Startup Activity, Main Street Entrepreneurship, and Growth Entrepreneurship.

The Kauffman Index of Startup Activity is an early indicator of the beginnings of entrepreneurship in the United States, focusing on new business creation, market opportunity, and startup density. The Kauffman Index of Main Street Entrepreneurship, introduced in 2015, measures business ownership and density of established, local small businesses.

In 2016, the series debuts another study—the Growth Entrepreneurship Index, which takes a dual approach to understanding growth business activity, relying on three indicators to look both at business revenue and job growth:

- Rate of Startup Growth
- Share of Scaleups
- High-Growth Company Density

The Kauffman Index of Entrepreneurship series represents extensive research and attempts to present a balanced perspective on how to measure entrepreneurship. However, because we recognize that entrepreneurship is a complex phenomenon, we expect to further revise and enhance the Index in the coming years.

The specific indicators from each report help tell America's entrepreneurship story. National, state, and local leaders can access all the reports, along with the data relevant to their locations, at www.kauffmanindex.org.

Growth Entrepreneurship Executive Summary

Growth entrepreneurship helps drive job creation, innovation, and wealth in the U.S. economy. Growth can and should be tracked both for its immediate economic benefits in terms of job creation and for the harder-to-quantify spreading of best practices and productivity that are often associated with growing and new firms (Sarada and Miranda 2016). High growth, particularly of young firms, has been identified in other research as an especially important contributor to job, output, and productivity growth (Haltiwanger et al. 2016).

The Kauffman Index of Growth Entrepreneurship is an indicator of business growth in the United States, integrating several high-quality sources of timely information into one composite indicator of entrepreneurial business growth. The Index captures growth entrepreneurship in all industries, and is based on data covering the universe of all U.S. employer businesses (approximately 5 million firms) and a privately collected benchmark of growth businesses. This allows us to measure business growth from both revenue and job growth perspectives. Moreover, we also present trends on business exits—more particularly initial public offerings, a business milestone commonly associated with innovative, high-growth companies.

Much of the attention and discussion around growth entrepreneurship focuses on growth inputs—things like patents, venture capital raised, valuations—with “unicorns,” for instance, taking up a large share of the discussion lately. While inputs are very important, our focus here is different. We focus on measures of the direct contribution to the economy of growth entrepreneurship through job and revenue growth.

This report presents trends in growth entrepreneurship over the last decade for the United States. Trends in growth entrepreneurship also are reported at the national level for specific industries for some of the Index components, when available. Additional Growth Entrepreneurship Indices present trends for all fifty states and the forty largest U.S. metropolitan areas by population.

The Kauffman Index of Entrepreneurship series is an umbrella of annual reports that measures U.S. entrepreneurship across national, state, and metro levels.

The Growth Entrepreneurship Index—an indicator of how much entrepreneurial businesses are growing—rose in the last year for the third year in a row, indicating that business growth has largely recovered from its Great Recession slump. A principle driver of this year’s uptick in growth is an increase in business employment growth indicators: startups are growing faster in their first five years than they were before, and more companies are reaching the scale of medium-sized or larger.

The Growth Entrepreneurship Index—an indicator of how much entrepreneurial businesses are growing—rose in the last year for the third year in a row, indicating that business growth has largely recovered from its Great Recession slump. A principle driver of this year’s uptick in growth is an increase in business employment growth indicators: startups are growing faster in their first five years than they were before, and more companies are reaching the scale of medium-sized or larger. Nonetheless, despite the recent year’s good news, entrepreneurial growth in the United States is largely down from the levels experienced in the 80s and 90s.

A Snapshot of National Trends in Growth Entrepreneurship

Growth Entrepreneurship Index

- The Growth Entrepreneurship Index rose in 2016—experiencing the largest year-over-year increase in the last decade. This indicates that business growth in America is finally being seen more broadly in the success of younger entrepreneurial businesses.

Rate of Startup Growth

- The Rate of Startup Growth was 58.5 percent in the first five years of operation, an increase of 11.6 percentage points compared to the previous cohort. Nonetheless, this indicator is down over the longer term.

Share of Scaleups

- The Share of Scaleups rose to 1.1 percent. While this is an increase from the previous years, the Share of Scaleups is still below the historical range seen through most of the 1990s and the first part of the 2000s.

High-Growth Company Density

- High-Growth Company Density remained flat in the recent year at 79.3 high-growth companies for every 100,000 U.S. employer businesses. Despite the recent year’s plateau, high-growth as measured by revenue has increased from the levels seen during the Great Recession.

Industry Trends in Growth Entrepreneurship

Industry Distribution and Top Industries of High-Growth Companies

- Looking more deeply at the industry distribution of companies in the High-Growth Company Density component of the Growth Entrepreneurship Index, we see that tech-associated industries like IT Services, Software, Computer Hardware, and Health continue to play a dominant role among high-growth firms in 2015. Nonetheless, overall growth comes from a huge swath of industries, such as Food & Beverage, Retail, and Government Services. These industry distributions suggest that, while important, *high tech is not a pre-requisite for high growth*.
- The top five industries with the most high-growth firms in 2015 were, in this order: 1) IT Services, 2) Advertising & Marketing, 3) Business Products & Services, 4) Health, and 5) Software.

Health Industry Trends in High-Growth Companies

- The number of high-growth companies in the Health industry experienced a steady increase since 2007, going from 4.7 percent of all high-growth companies to 7.9 percent in the latest year with data available. This upward trend continued even throughout the Recession, while most other industries were experiencing declines.

Government Services Industry Trends in High-Growth Companies

- In 2010, at the height of the Great Recession, while most industries were experiencing declines in growth entrepreneurship activity, one industry seemed to be thriving: Government Services. The number of high-growth companies in this sector went up 167 percent, from 102 companies in 2007 (2.7 percent of high-growth firms in that year) to 272 companies in 2010 (9.2 percent of high-growth firms in that year). The Government Services share of high-growth companies has retreated somewhat in the past few years, with this industry capturing 4.8 percent of all high-growth companies in 2015.

Housing-Associated Industries Trends in High-Growth Companies

- The number of high-growth companies in the combined housing-associated industries of Construction and Real Estate fell 71.2 percent from 2007 to 2010—from 479 to 138 high-growth businesses in each respective year. These industries have recovered somewhat in recent years to a total of 329 high-growth businesses in 2015.

“Maker” Industries Trends in High-Growth Companies

- Despite the excitement around the Maker Movement, industries associated with it—in this case, Manufacturing and Computer Hardware industries—have been on a downward trend since 2007, going from 11 percent of all high-growth companies in 2007 to only 3.3 percent in the latest year with data available.

Understanding Growth Entrepreneurship—A Look at the Indicators

Growth Entrepreneurship can take many forms. Here we define and measure it based on job and revenue growth.

Businesses grow in different ways. Some grow rapidly and very publicly—think Uber or any of the prominent tech unicorns. Others are born and grow for longer periods below the public radar, perhaps in industries or regions that are less visible to the general public and media. Here think Chobani, which has become a household brand with its Greek yogurt with over \$1B in revenue and more than a thousand employees—but is not a stereotypical growth company. It was founded in 2005,

in rural New York State, and originally funded with an SBA loan with no external investors at all (Ulukaya 2013). Even as a billion-dollar company, Chobani’s founder was its sole owner until very recently. Beyond these are the numerous companies that achieve high growth and millions of dollars of revenue and, together, power hundreds of thousands of jobs—even though most people have never heard of them. Entrepreneur and investor Brad Feld calls these the “silent killers,” companies that cause little fanfare, do not spend time in the media, and are often not based in the Bay Area—and yet grow to multi-million dollar revenues (Feld 2011).

The Kauffman Index of Growth Entrepreneurship presents a novel gauge that attempts to bring together potential measures of business growth in the United States—across national, state, and metropolitan-area levels. The Index captures entrepreneurial growth along three indicators. First, it captures the **Rate of Startup Growth**—how much, on average, startups in the United States grew in their first five years after founding as a cohort. Second, it captures the **Share of Scaleups**—the number of businesses starting small and growing to medium-sized or larger (employing fifty or more people) by their tenth year of operation as a percentage of all employer firms. Third, it captures **High-Growth Company Density**—the prevalence of fast-growing, private companies in a region with at least 20 percent annualized growth over three years and \$2 million dollars in annual revenue. The combination of these three distinct and important growth indicators provides a broad view of Growth Entrepreneurship across national, state, and metropolitan-area levels, complementing the two existing Kauffman Index annual releases: Startup Activity and Main Street Entrepreneurship.

Capturing growth entrepreneurship across three indicators, the Growth Entrepreneurship Index provides balanced and extensive documentation of the business growth of both young companies and more-established private firms in the United States. The Growth Entrepreneurship Index captures all industries. It is based on administrative tax data covering all U.S. employer business entities (approximately 5 million companies) and on a privately compiled dataset covering the fastest-growing private companies in America, as measured by their revenue growth. The Growth Entrepreneurship Index improves over other possible measures of growth entrepreneurship in its timeliness, dual approach of capturing both employee and revenue growth, and inclusion of all types of business activity, regardless of industry.

The numerous paths that growth companies can take underlie why we need to use many indicators to

understand and measure the phenomenon. The Growth Entrepreneurship Index presents various measures of growth, but also aggregates each measure into one unified statistic that local and national entrepreneurs, entrepreneurship supporters, and policymakers can use to understand growth in their geographies.

The Components of the Kauffman Index of Growth Entrepreneurship

The Kauffman Index of Growth Entrepreneurship is an equally weighted index of three normalized measures of growth:¹

1. The **Rate of Startup Growth**, calculated as how much startups have grown, on average, after five years of founding, as measured by change in employment.
2. The **Share of Scaleups**, calculated as the number of firms that started small but grew to employ fifty
3. The **High-Growth Company Density** of a region, measured as the number of private businesses with at least \$2 million in annual revenue reaching three years of 20 percent annualized revenue growth, normalized by total employer business population.

Before presenting trends in the Growth Entrepreneurship Index, we briefly discuss each component measure (see Methodology and Framework for more details).

First, the Rate of Startup Growth captures the average growth of all young employer businesses in the economy. The Rate of Startup Growth captures employer businesses regardless of industry, and calculates their average growth as a cohort of businesses during their first five years of operation—from the founding year to year five. Startup businesses here are defined as employer firms less than one year old employing at least one person besides the owner. The Rate of Startup Growth is calculated based on data from U.S. Census Bureau’s Business Dynamics



Rate of Startup Growth



Share of Scaleups



High-Growth Company Density

1. We normalize each of three measures by subtracting the mean and dividing by the standard deviation for that measure (i.e., create a z-score for each variable). This creates a comparable scale for including the three measures in the Growth Entrepreneurship Index. We use annual estimates from 2007 to the latest year available (2013 or 2015) to calculate the mean and standard deviations for each component measure (see Methodology and Framework for more details).

Rate of Startup Growth



- Proxy measure of business growth and startup traction across young businesses.
- Measures the average growth of cohorts of new employer firms from the year they were founded through their fifth year of operation.
- Calculates growth by comparing the average size of all startups from a given year to the average size of surviving, young companies in year five of operation. All industries are included in this measure.
- Data based on author calculations from the U.S. Census Bureau's Business Dynamics Statistics.
- What the number means:
 - For example, the Rate of Startup Growth was 70.3 percent for Colorado in the 2016 Index. That means that, on average, Colorado companies turning five years old have grown 70.3 percent since their founding, from 4.7 average employees at the time of founding to 8.0 average employees by year five.

Statistics (BDS) and is taken from the universe of businesses with payroll tax records in the United States, as recorded by the Internal Revenue Service. This dataset covers approximately 5 million companies.

The second component measure of the Growth Entrepreneurship Index is the Share of Scaleups, calculated as the number of firms—as a percentage of all surviving firms ten years and younger—that started out small, with fewer than fifty employees, but reached the scale of having fifty employees or more by their tenth year of operation. Whereas the Rate of Startup Growth looks at the estimated average growth of each cohort of employer

firms, the Share of Scaleups focuses exclusively on firms reaching fifty employees or more. Like the Rate of Startup Growth component, the Share of Scaleups index component is based on the U.S. Census Bureau's Business Dynamics Statistics, which covers all employer firms in the United States with payroll tax records as tracked by the Internal Revenue Service.

The third component of the Growth Entrepreneurship Index is the High-Growth Company Density—a measure of the prevalence of private, high-growth companies with at least \$2 million dollars in annual revenue by the final year observed and 20 percent annualized growth over a three-

Share of Scaleups



- Proxy measure of how many startups become scaleups.
- Measures the percentage of surviving companies that become medium-sized businesses or larger in their first ten years of operation, but did not start in that size category. All industries are included on this measure.
- Medium-sized or larger companies are defined as firms having fifty employees or more.
- Data based on author calculations from the U.S. Census Bureau's Business Dynamics Statistics.
- What the number means:
 - For example, the United States Share of Scaleups was 1.1 percent in the 2016 Index. That means approximately 1,100 out of every hundred thousand companies ten years and younger started small and became medium-sized businesses with fifty employees or more.

year period, which compounds to 72.8 percent after the three years. While the other two components of the Index use number of employees to measure growth, revenue is an important factor to consider when analyzing growing firms, because the relationship between employment growth and revenue growth is complex, and is not always directly linked across different industries.

The number of high-growth firms is based on the perennial Inc. 500|5000 list of the fastest-growing private companies in America. At the top end of the distribution, Inc. high-growth companies have up to multi-billion dollar revenues and growth rates of many orders of magnitude after three years. At the lower end of the distribution, the data has been filtered by the authors to only include firms with at least 20 percent annualized growth over three years and \$2 million dollars in revenue by the third year of growth. This filtering excludes between 20 and 40 percent of the 5,000 firms on the Inc. list in a given year. Applying a consistent growth threshold to the list allows us to track trends in the population of Inc. 500|5000 companies over time. *Inc.* magazine has compiled the Inc. 500 list every year since 1982, and some firms included on the lists have grown further to become Fortune 500 companies and become publicly traded or acquired. These firms come from a wide range of industries, from high-tech to everyday retailers. The dataset is one of the few that allows us historically and reliably to track trends of revenue-focused high-growth in the country at the national, state, and metro levels.

In this report, we first present national estimates of the Growth Entrepreneurship Index, followed by trends in each of the three component measures of the Index.

A Big Tent Approach to Entrepreneurship

The Kauffman Index of Entrepreneurship—the umbrella under which all Kauffman Index reports reside—attempts to view the complex phenomenon of entrepreneurship from many angles, each adding insight into the people and businesses that contribute to America’s overall entrepreneurial dynamism.

Entrepreneurship is not a monolithic phenomenon, and it includes many moving parts. Creating new businesses is a different economic activity from running small businesses, which in turn is different from growing businesses. The Kauffman Index attempts to measure concretely these different kinds of entrepreneurship—Startup Activity, Main Street Entrepreneurship, and Growth Entrepreneurship. The Kauffman Index of Startup Activity focuses on the beginnings of entrepreneurship,



High-Growth Company Density

- Proxy measure of number of high-growth companies by total business population.
- High-growth companies are defined as private businesses with at least \$2 million dollars in annual revenue with 20 percent annualized revenue growth over a three-year period. There is no age requirement on this indicator. The age of firms spans a wide range, although they skew young.
- Companies in this dataset have up to multi-billion-dollar revenues and growth rates as high as tens of thousands percent. High-growth companies on this dataset have included prominent businesses like Facebook, Go Pro, Microsoft, Oracle, and Zappos, as well as numerous high-growth businesses under the public radar.
- Data based on author calculations from the Inc. 500|5000 private dataset of fastest-growing companies in the United States and on business population data from the U.S. Census Bureau’s Business Dynamics Statistics.
- What the number means:
 - For example, the 2016 Index High-Growth Company Density for the New York metropolitan area was 84.7. That means that, for every 100,000 employer business in the New York metro area, there were 84.7 high-growth firms.

specifically new business creation, market opportunity, and startup density. The Kauffman Index of Main Street Entrepreneurship focuses on the prevalence of local small business and local business ownership. The newest report in the Kauffman Index series, the 2016 Kauffman Index of Growth Entrepreneurship, focuses on growing companies. Together, these three indices present a more holistic view of entrepreneurship in America.

Each of the indices that make up the Kauffman Index is constructed to give a spectrum of entrepreneurship measures from an industry-agnostic perspective. Table A

summarizes the approach we use across the reports.

The first component of the Kauffman Index of Growth Entrepreneurship—the Rate of Startup Growth—captures how the average employment at the overall cohort of new firms changes from birth to age five. While many new businesses will discontinue their operations,² those that remain often will grow, on average. The Rate of Startup Growth looks at the average growth trajectory of these birth cohorts to see their aggregate role on a given economy through changes in employment.

Table A
Summary of Components Used Across Reports

| Startup Activity | Main Street Entrepreneurship | Growth Entrepreneurship |
|--|---|--|
|  <p>Rate of New Entrepreneurs The percentage of adults transitioning into entrepreneurship at a given point in time</p> |  <p>Rate of Business Owners The total number of business owners in a location at a given point in time</p> |  <p>Rate of Startup Growth The average growth of a cohort of new startups in their first five years</p> |
|  <p>Opportunity Share of New Entrepreneurs The percentage of new entrepreneurs driven primarily by “opportunity” vs. “necessity”</p> | |  <p>Share of Scaletups The number of businesses that started small and grew to employ at least fifty people by their tenth year of operation as a percentage of all businesses ten years and younger</p> |
|  <p>Startup Density The number of new employer businesses normalized by population</p> |  <p>Established Small Business Density The number of businesses older than five years with less than fifty employees normalized by population</p> |  <p>High-Growth Company Density The number of fast-growing companies with at least \$2 million dollars in annual revenue normalized by business population</p> |

2. Approximately half of startups remain in operation five years later, according to our calculations for U.S. Census Bureau’s Business Dynamics Statistics data.

The second component of the Kauffman Index of Growth Entrepreneurship—the Share of Scaleups—captures the number of businesses starting small and becoming medium-sized or larger by their tenth years of operation as a percentage of all employer firms ten years and younger. This component shares similarities with the Startup Activity Index’s Opportunity Share of New Entrepreneurs. Both of these measures attempt to narrow in on a specific population of more growth-oriented companies. With the Share of Scaleups, we look directly at the number of businesses that grow to more than fifty employees but did not start out that way, while with the Opportunity Share of New Entrepreneurs we examine new entrepreneurs likely beginning their journey out of opportunity rather than necessity and which, by inference, could be more likely to also grow.

The last component of the Kauffman Index of Growth Entrepreneurship—the High-Growth Company Density—benchmarks the density of fast-growing private companies with at least \$2 million in annual revenue. Fast growth in this case is defined as an annualized revenue growth of 20 percent over a three-year period—which compounds to 72.8 percent after the three years. In this measure, growth is examined at any stage of the business. Note that we are no longer limiting our population to companies in their early years of operations. As with the other measures, this indicator is industry agnostic. This measure uses the annual Inc. 500|5000 lists of the fastest-growing private businesses in America as a starting point before applying a minimum growth threshold and requirement of at least \$2 million dollars in revenues.

This growth threshold usually excludes between 20 and 40 percent of the 5,000 firms on the Inc. list in a given year. This indicator has some similarities to the Startup Density and Established Small Business Density measures in that it is attempting to describe a specific type of business in a population-normalized manner. The High-Growth Company Density has no upper-bound restriction on firm age, though it does require firms to be at least three years old. As such, the age of high-growth firms spans a wide range, although these firms skew young. A plurality of high-growth companies (31.5 percent) are aged between five and seven years old, and 59.1 percent are ten years old and younger.

While at first pass one might expect the Startup Density component of the Startup Activity Index to relate with future years of the Growth Entrepreneurship’s Rate of Startup Growth and Share of Scaleups measures, we have taken steps to minimize the overlap on these measures. The Startup Activity indicators focus only on new firm formation measures, while the Growth Entrepreneurship Index captures only growth outcomes, and imposes no penalty to a location for having relatively fewer startups. In other words, a location may have many startups that do not grow much at all later on—and this place would have higher rates of Startup Activity but lower rates of Growth Entrepreneurship. Similarly, a location could have relatively few startups, but the startups this place does have could grow at high rates. This latter place would have low rates of Startup Activity but higher rates of Growth Entrepreneurship.

A Look at Startup Growth Potential

The conversation around entrepreneurship measurement has increased in the last year with Guzman and Stern’s recent research attempting to use predictive techniques to connect aspects of a new firm’s business registration to later growth outcomes, specifically reaching a meaningful exit (IPO or M&A) within six years of founding (Guzman and Stern 2016). This research holds much promise for the future of entrepreneurship research, as it may hold the possibility of even finer-grain geographic analysis and better predictive techniques beyond just counting business registrations. However, while compelling—and, indeed, Kauffman Foundation activities have supported, financially and otherwise, this work in many ways—the data measuring startup growth potential has not reached national coverage, although it may spread to other geographies in the near future. With that, the Growth Entrepreneurship Index focuses on actual observed growth outcomes rather than ex ante growth potential of startups.

National Trends in Growth Entrepreneurship Activity

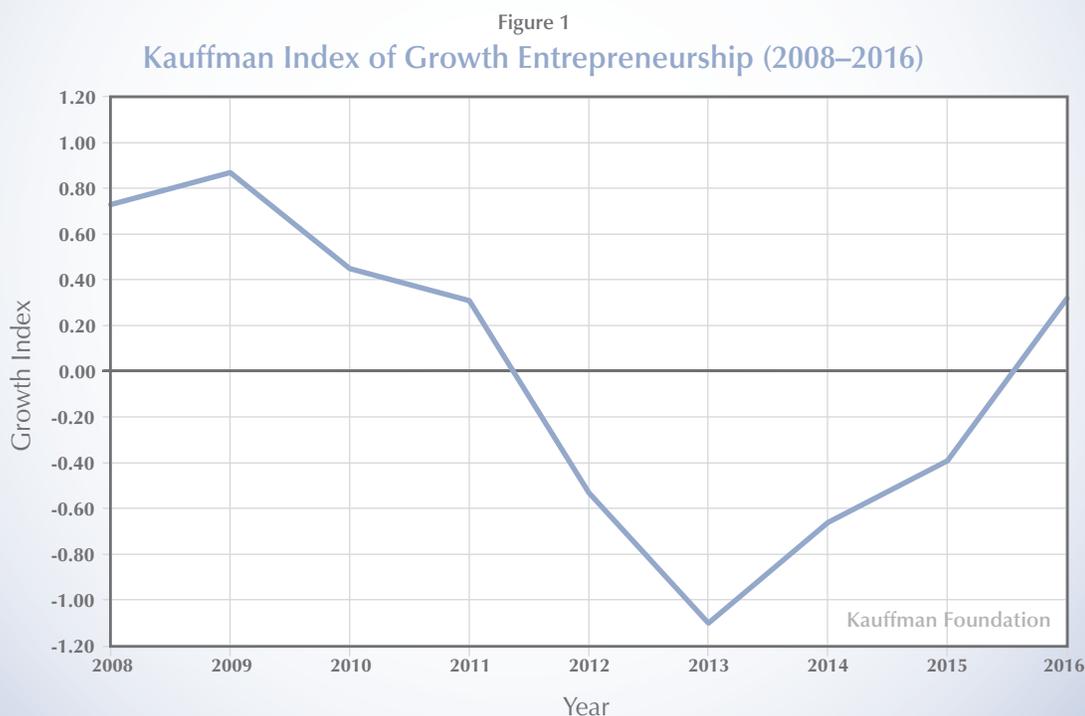
The Kauffman Index of Growth Entrepreneurship calculates an index measure of growing and high-growth business activity in the United States. Figure 1 (below) and Table 1 (in Appendix) present results for the Growth Index from 2008 to 2016.

The Growth Entrepreneurship Index rose substantially in 2016—continuing an upward trend that started in 2014. Over approximately the past decade, the Growth Entrepreneurship Index generally has followed the

business cycle, but with a slight time lag to the full business cycle. Growth Entrepreneurship was high leading up to the Great Recession and fell for some time after the business cycle began to recover—with its lowest level of activity measured in 2013. Entrepreneurial growth remains a rare phenomenon—most companies do not grow or intend to grow. However, the increase in the Growth Entrepreneurship Index in 2016 was large and indicates a broad-based return of growth across young and older firms in the United States.

We next discuss trends in each of the three component measures of the Growth Entrepreneurship Index. Each measure is focused on a different aspect of business growth, calculated in terms of both revenue and employment changes.

Growth Entrepreneurship was high leading up to the Great Recession and fell for some time after the business cycle began to recover—with its lowest level of activity measured in 2013.



SOURCE: Authors' calculations using the BDS and Inc. 500|5000 data. For an interactive version, please see: www.kauffmanindex.org.



National Trends in Rate of Startup Growth

Business dynamics around the time of new business entry are messy, with approximately 400,000 new employer businesses being created in the United States each year, recently.³ We know that around 45 percent of new businesses survive their first five years of operation, with the rest of the new businesses ceasing operations or being absorbed into other businesses. Others have described this as a process of experimentation, as entrepreneurs seek to find their markets and certain businesses continue operating and expanding (Kerr, Nanda, and Rhodes-Kropf 2014).

This first component of the Growth Entrepreneurship Index, the Rate of Startup Growth, captures how much, on average, the cohort of startup businesses grow in

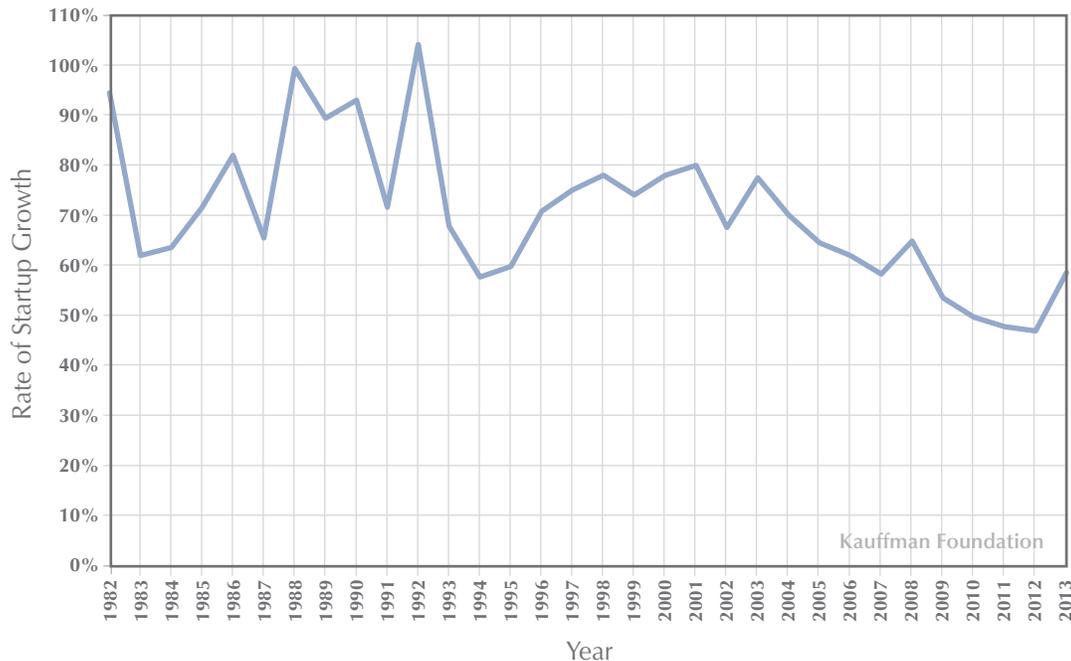
employment in their first five years of operation. We present this indicator going back from 1982 to 2013, the latest year for which the data are available. This is a yearly measure calculated from the U.S. Census Bureau's Business Dynamics Statistics. Figure 1A (below) and Table 1A (in Appendix) present results.

The Rate of Startup Growth for the most recent year available (2013), was 58.5 percent. This indicates that the average U.S. startup from 2008 (which is now five years old in 2013, the latest year for which data are available) grew from 5.8 employees when founded to 9.2 employees after five years of operation (Figure 1B). This was an increase in the Rate of Startup Growth from the previous year, when it was 46.9 percent, the lowest level ever recorded for this indicator since the early '80s.

Historically, this indicator has been around 75 percent over the first two decades for which data are available ('80s and '90s) but has decreased in volatility and trended downward since at least 2003.



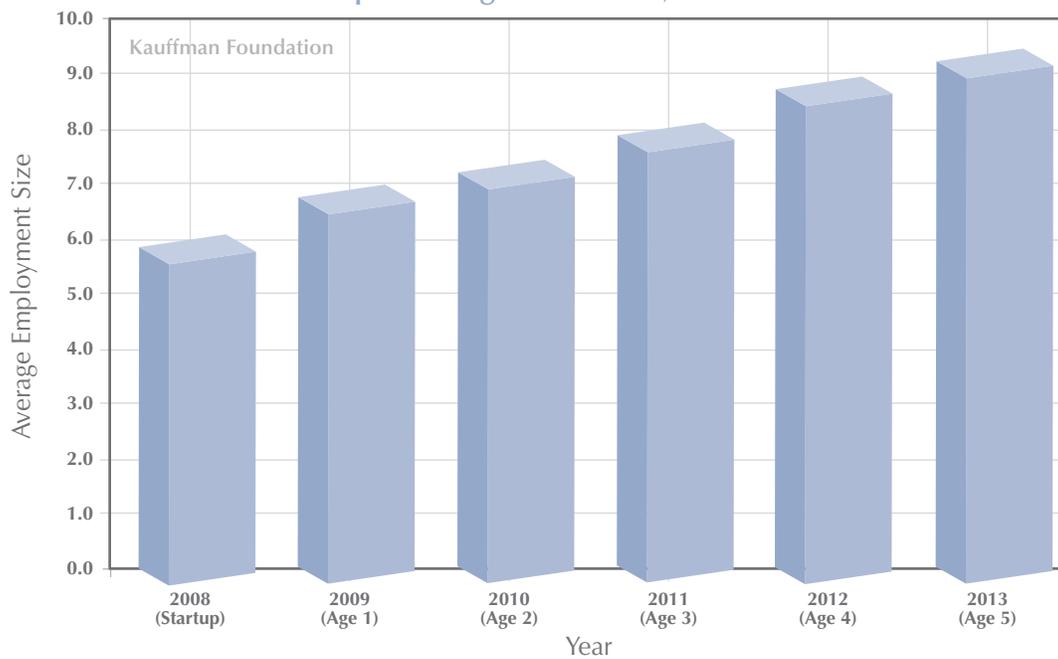
Figure 1A
Rate of Startup Growth (1982–2013)



SOURCE: Authors' calculations using the BDS. For an interactive version, please see: www.kauffmanindex.org.

3. Authors' calculations from U.S. Census Business Dynamics Statistics data.

Figure 1B
Average Size of Surviving Business by Number of Employees
for Startups Turning Five in 2013, born in 2008



SOURCE: Authors' calculations using the BDS. For an interactive version, please see: www.kauffmanindex.org.



National Trends in Share of Scaleups

The second component of the Growth Entrepreneurship Index, the Share of Scaleups, looks at the number of companies that grow to employ at least fifty people in the first ten years after creation (what we call scaleups), as a percentage of all employer firms ten years and younger. So, while the Rate of Startup Growth looks at the average growth of the whole cohort of young firms, the Share of Scaleups focuses only on tracking the firms that reach a certain scale, as measured by employment size.

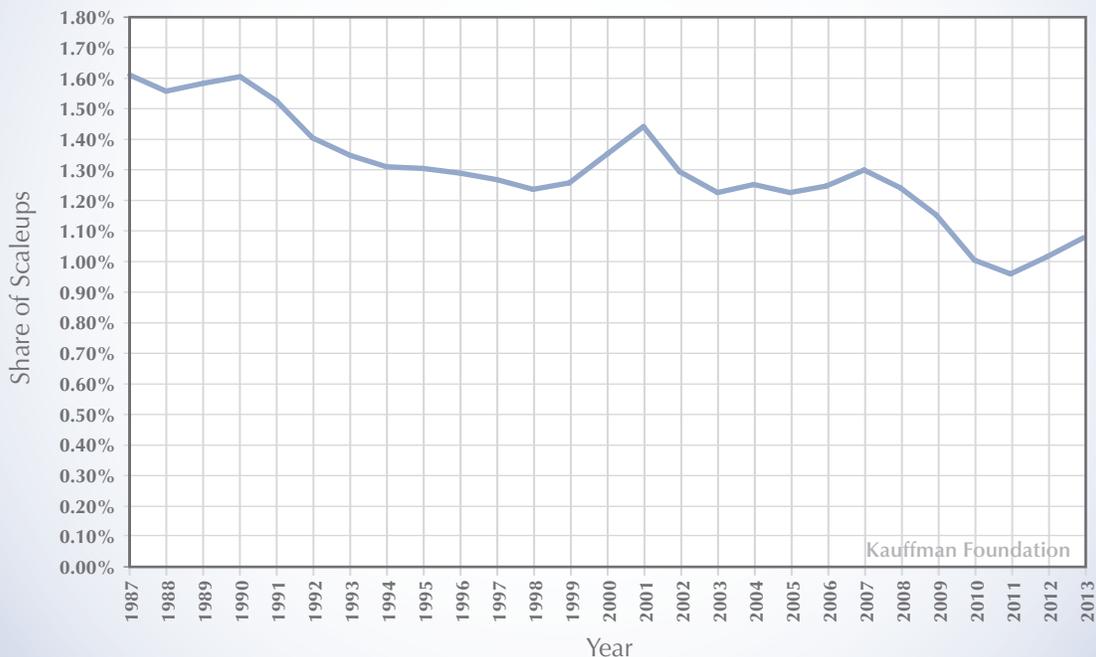
The Share of Scaleups rose in 2013, the most recent year of data available and utilized in the 2016 Index,

to 1.1 percent after falling steadily during the Great Recession to reach its lowest point in 2011 at 0.9 percent. This means that approximately 1,100 companies out of every 100,000 firms ten years of age and younger started small and reached a scale of more than fifty employees. This is a yearly measure calculated from the U.S. Census Bureau's Business Dynamics Statistics. We present this indicator from 1982 to 2013 in Figure 1C (below) and Table 1C (in Appendix), the latest year for which the data are available.

Historically, the Share of Scaleups has trended downward, indicating that fewer young businesses are growing to be at least medium-sized over time. However, this measure has experienced highs during times of economic expansion; for example, reaching its highest peak in the past twenty years in 2001, at the height of the internet bubble.



Figure 1C
Share of Scaleups (1987–2013)



SOURCE: Authors' calculations using the BDS. For an interactive version, please see: www.kauffmanindex.org.



National Trends in High-Growth Company Density

The third and last component of the Growth Entrepreneurship Index, the High-Growth Company Density, looks at the number of high-growth private companies in an area. So, while the Share of Scaleups measures the number of firms that reach more than fifty employees while they are young, the High-Growth Company Density looks at the number of private firms, regardless of their ages, achieving at least 20 percent annualized growth over a three-year period with at least \$2 million dollars in annual revenue. While the Rate of Startup Growth and the Share of Scaleups focuses on employment-based growth indicators, the High-Growth Company Density is a revenue-based indicator. This is a yearly measure based on the perennial Inc. 500|5000 list of the fastest-growing private companies in America for high-growth firm counts and on the U.S. Census Bureau's Business Dynamics Statistics for overall firm population data. We present this indicator from 2007 to 2015, the latest year for which the data are available.

The High-Growth Company Density has no upper-bound restriction on firm age, though it does require firms to be at least three years old. As such, the age of high-growth firms spans a wide range, although these firms skew young. A plurality of high-growth companies (31.5 percent) are aged between five and seven years old, and 59.1 percent are ten years old and younger.

Both researchers and entrepreneurs have suggested density as a key indicator of vibrancy in entrepreneurial ecosystems, and the Kauffman Index data show a high variation on this indicator across metropolitan areas in the United States (Stangler and Bell-Masterson 2015; Feld 2012).

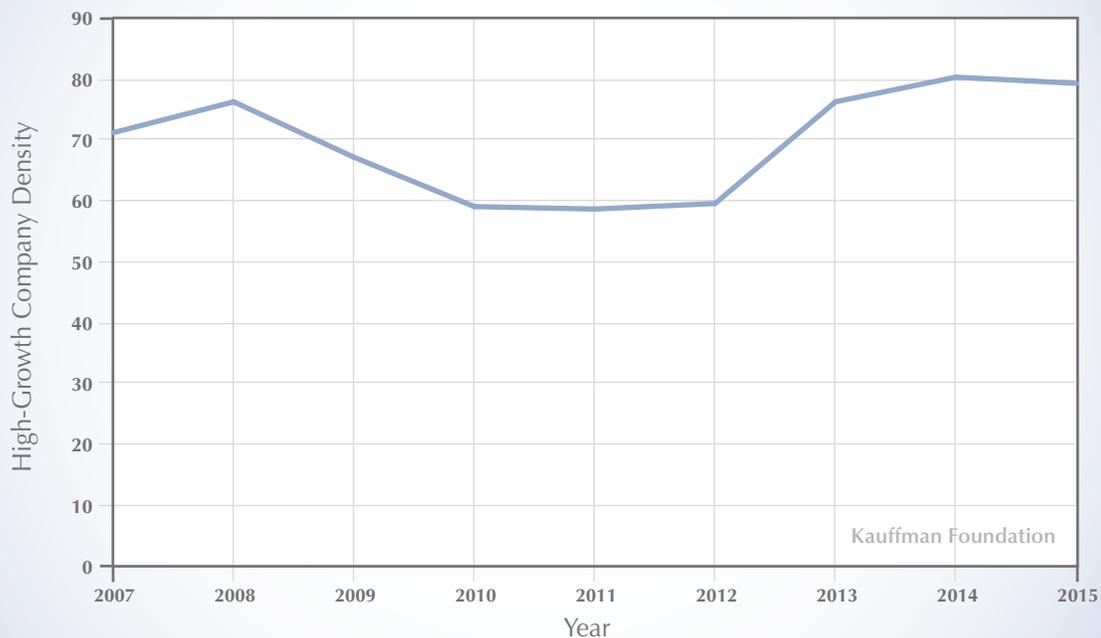
High-Growth Company Density fell sharply in the aftermath of the Great Recession, and went up for two years in a row starting in 2013, plateauing in 2015 at 79.3 high-growth companies for every 100,000 employer business in the United States.

Figure 1D and Table 1D report results for trends in high-growth companies, as measured by revenue growth.



Figure 1D

High-Growth Company Density (2007–2015)



SOURCE: Authors' calculations using the BDS and Inc. 500|5000 data. For an interactive version, please see: www.kauffmanindex.org.



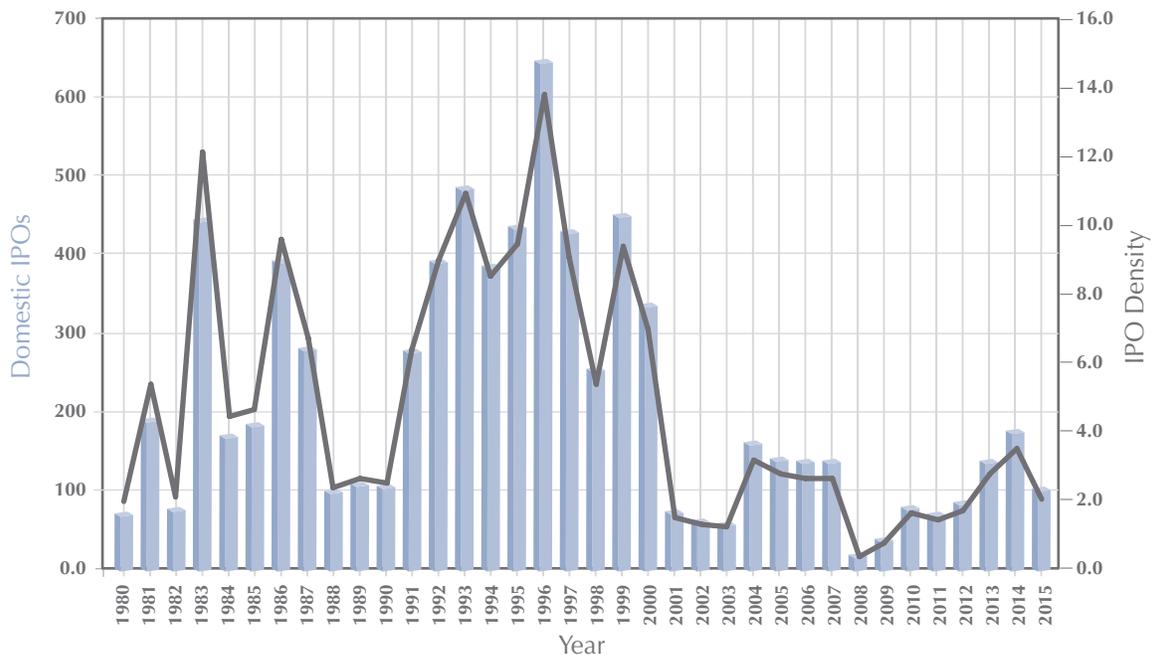
A Look at Initial Public Offerings in the United States

Little more captures “making it” in business than the day a company starts being publicly traded. Ringing the “bell,” the making of millionaires (and often billionaires), and the transformation from being a privately held company into a publicly owned one. Initial public offerings are among the most visible indicators of growth companies; however, the small number of IPOs in any given year makes it a difficult metric to comprehensively integrate into the Growth Index. So, for now, we present statistics on Initial Public Offerings as an appendix to the Growth Entrepreneurship indicators.

Using preliminary data from 1980–2015, we present historical trends for IPO density in the United States—calculated as the number of IPOs in a year per every 100,000 employer businesses in the country.^{4,5} For our purposes, not all IPOs are created equal. We focus on IPOs that are related to emerging growth companies or *de novo* IPOs and not IPOs that are new legal entities of existing companies. Also, IPOs are a global phenomenon with many foreign offerings on U.S. markets and some U.S. offerings on foreign exchanges. The data presented here attempt to only count domestic-headquartered, emerging growth, and domestic-IPOed firms in a given year.

More than other indicators we present in the Kauffman Index of Growth Entrepreneurship, U.S. IPOs and IPO density vary dramatically across time. Since experiencing the lowest number of IPOs in 2008—only eighteen American companies went public in that year—the number of U.S. IPOs has recovered. Nonetheless, it still remains well below pre-2000 levels of IPO activity.

Figure 2
IPOs in the United States Over Time (1980–2015)



SOURCE: Authors' calculations using Jay Ritter's "Initial Public Offerings: Foreign IPOs in the U.S., 1980–2015" and the BDS.

4. The source for the number of employer firms is the U.S. Census Bureau's Business Dynamics Statistics (BDS), and we use the latest available BDS number (2013) to normalize the 2014 and 2015 IPO activity.

5. The IPO data used here comes from Jay Ritter's "Initial Public Offerings: Foreign IPOs in the U.S., 1980-2015" summary. It includes American Depositary Receipts (ADRs) as well as other IPOs; and excludes "IPOs with an offer price below \$5.00 per share, unit offers, REITs, closed-end funds, natural resource limited partnerships, small best efforts IPOs, banks and S&Ls, and IPOs not listed on CRSP (this last screen limits the sample to NASDAQ, Amex, and NYSE-listed issues) within six months of the offer date." For more on this, please see Ritter, Jay R. "Initial Public Offerings: Foreign IPOs in the U.S., 1980-2015." March 8, 2016. Accessed April 21, 2016. <https://site.warrington.ufl.edu/ritter/files/2016/03/Initial-Public-Offerings-Foreign-IPOs-in-the-US-1980-2015-2016-03-08.pdf>.

Industry Trends for High-Growth Companies

The detailed industry data from Inc. allows us to explore industry trends for high-growth companies. In this section, we look at industries with the highest shares of high-growth companies and present industry profiles over time for select industries. See Table B.

While tech-associated industries play a large role among high-growth firms in 2015—with IT, Health, and Software all among the top five industries with the highest shares of high-growth companies—the industry distribution for growth businesses is wide. This industry distribution includes sectors not always associated with fast-growing businesses, such as Food & Beverage, Retail, and Government Services.

For a complete list of industries of high-growth companies in 2015, please see Table C below.

Table B | Top Five Industries with Highest Share of High-Growth Companies (2015)

| Rank | Industry | High-Growth Companies | Share (%) |
|------|------------------------------|-----------------------|-----------|
| 1 | IT Services | 521 | 13.0% |
| 2 | Advertising & Marketing | 397 | 9.9% |
| 3 | Business Products & Services | 367 | 9.2% |
| 4 | Health | 315 | 7.9% |
| 5 | Software | 289 | 7.2% |

Source: Authors' calculations from Inc. 500|5000 data.

Table C | Industries by Share of High-Growth Companies (2015)

| Rank | Industry | High-Growth Companies | Share (%) |
|------|------------------------------|-----------------------|-----------|
| 1 | IT Services | 521 | 13.0% |
| 2 | Advertising & Marketing | 397 | 9.9% |
| 3 | Business Products & Services | 367 | 9.2% |
| 4 | Health | 315 | 7.9% |
| 5 | Software | 289 | 7.2% |
| 6 | Financial Services | 195 | 4.9% |
| 7 | Construction | 195 | 4.9% |
| 8 | Government Services | 193 | 4.8% |
| 9 | Consumer Products & Services | 188 | 4.7% |
| 10 | Human Resources | 147 | 3.7% |
| 11 | Real Estate | 134 | 3.3% |
| 12 | Retail | 131 | 3.3% |
| 13 | Food & Beverage | 123 | 3.1% |
| 14 | Logistics & Transportation | 113 | 2.8% |
| 15 | Manufacturing | 111 | 2.8% |
| 16 | Telecommunications | 89 | 2.2% |
| 17 | Energy | 88 | 2.2% |
| 18 | Security | 71 | 1.8% |
| 19 | Engineering | 63 | 1.6% |
| 20 | Education | 58 | 1.4% |
| 21 | Insurance | 55 | 1.4% |
| 22 | Travel & Hospitality | 52 | 1.3% |
| 23 | Media | 51 | 1.3% |
| 24 | Environmental Services | 39 | 1.0% |
| 25 | Computer Hardware | 23 | 0.6% |

Source: Authors' calculations from Inc. 500|5000 data.

Changes in Industry Distribution of High-Growth Companies

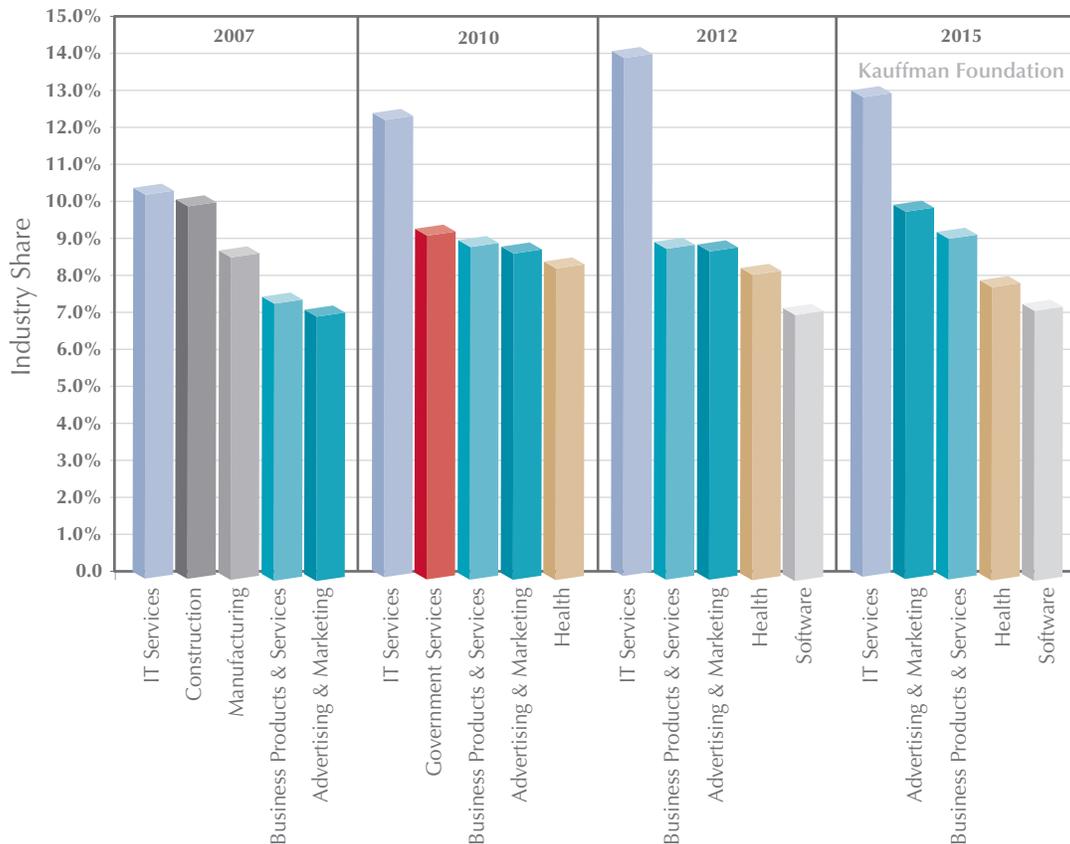
The industries with the highest shares of high-growth companies have changed over time across different business cycles. Certain changes were particularly pronounced during the Great Recession and its aftermath.

In 2007, just before the Great Recession hit, the Construction industry was the sector with the second-highest number of fast-growing businesses (Figure 3–2007). This high performance, fueled by the housing bubble, quickly fizzled during the Recession, with the number of high-growth companies in the combined industries of Construction and Real Estate going down a dramatic 71.2 percent from 2007 to 2010—from 479 to 138 high-growth businesses in each respective year (Figure 10–Industry Profile).

In 2010, at the height of the Great Recession, while most industries were experiencing declines in growth entrepreneurship activity, one industry seemed to be thriving: Government Services. The number of high-growth companies in this sector went up 167 percent, from 102 companies in 2007 to 272 companies in 2010 (Figure 9–Industry Profile). Because this sector was growing while others were shrinking, its rise in share of high-growth companies was even more pronounced, going up 2.4 times—and making Government Services the sector with the second-highest number of high-growth companies in 2010 (Figure 3–2010). Noticeably, the number of high-growth companies in this sector went down after the peak of the Great Recession.

Starting in 2012, the top five industries with the highest shares of high-growth companies have, for the moment, stabilized in five sectors: 1) IT Services,

Figure 3
Top Five Industries with Highest Share of High-Growth Companies
(2007, 2010, 2012, 2015)



SOURCE: Authors' calculations from Inc. 500|5000 data. For an interactive version, please see: www.kauffmanindex.org.

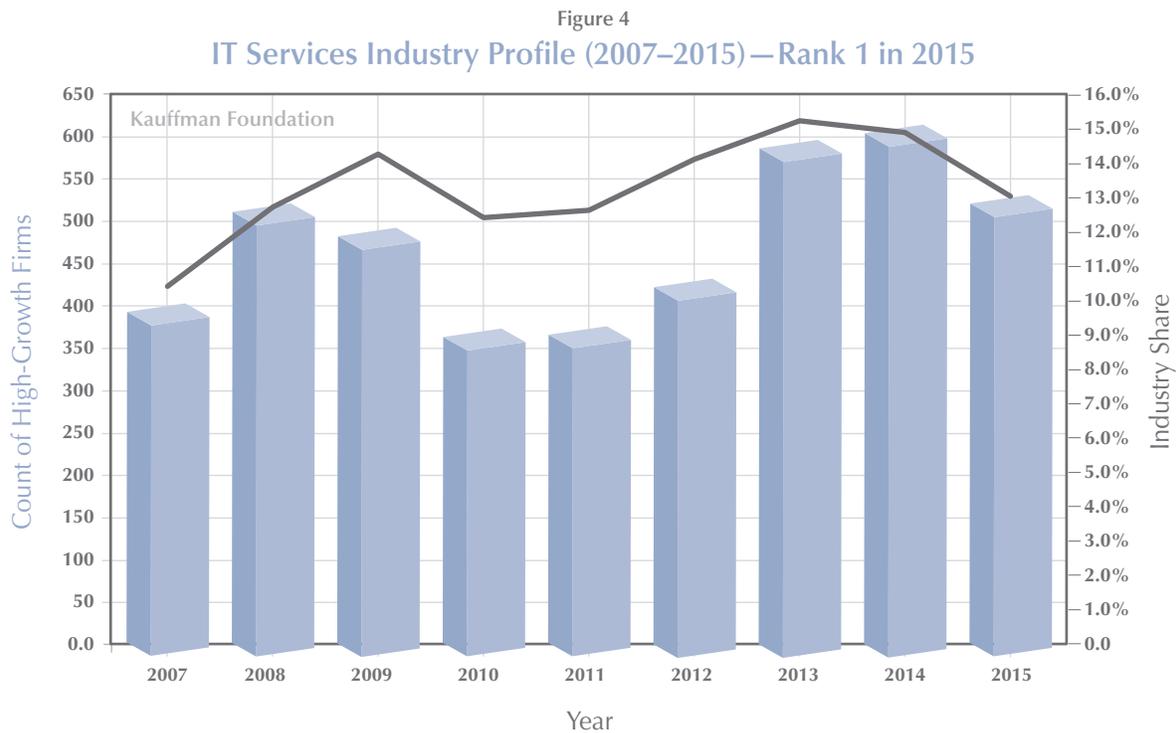
2) Advertising & Marketing, 3) Business Products & Services, 4) Health, and 5) Software (Figure 3–2012). These industries have been in the top five for high-growth every year since then, including in 2015 (Figure 3–2015). Moreover, three of these industries—IT, Advertising, and Business Products—were also in the top five in 2007.

Of those five industries, IT Services, Advertising & Marketing, Business Products & Services, and Software have performed well virtually every year, although they experienced cyclical ups and downs (Figures 4–7–Industry

Profiles). Health is the only industry here that has consistently experienced increases almost every year—including during the Great Recession (Figure 7–Industry Profile).

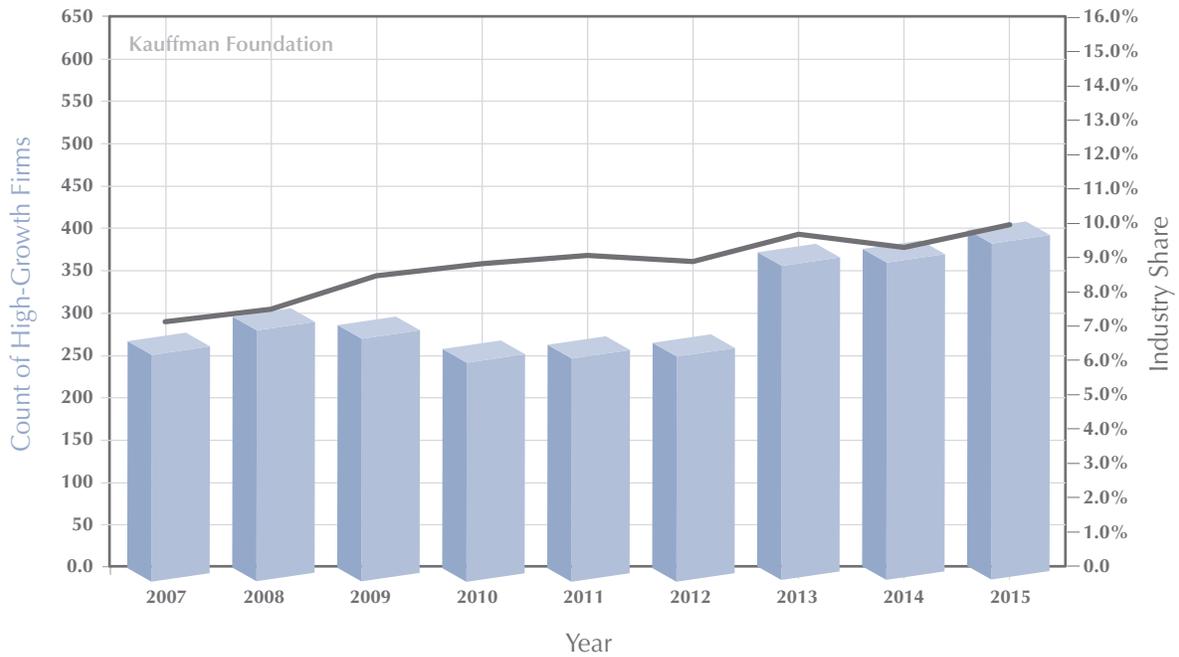
Some of these changes, and others, can be seen in Figure 3 and in the select industry profiles in Figures 4–11 and the tables in the Appendix.

For a comprehensive list with interactive graphs showing all industries’ performance over time, as well as industry profiles, please see: www.kauffmanindex.org.



SOURCE: Authors’ calculations from Inc. 5000 data. For an interactive version, please see: www.kauffmanindex.org.

Figure 5
Advertising & Marketing Industry Profile (2007–2015)—Rank 2 in 2015



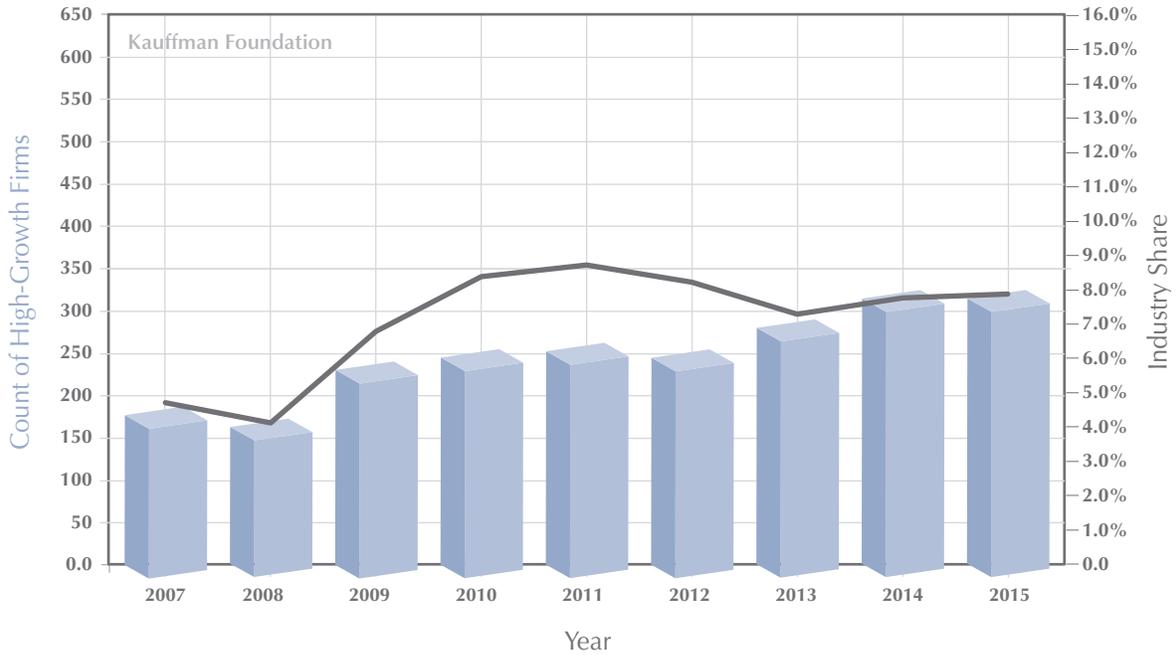
SOURCE: Authors' calculations from Inc. 5000 data. For an interactive version, please see: www.kauffmanindex.org.

Figure 6
Business Products & Services Industry Profile (2007–2015)—Rank 3 in 2015



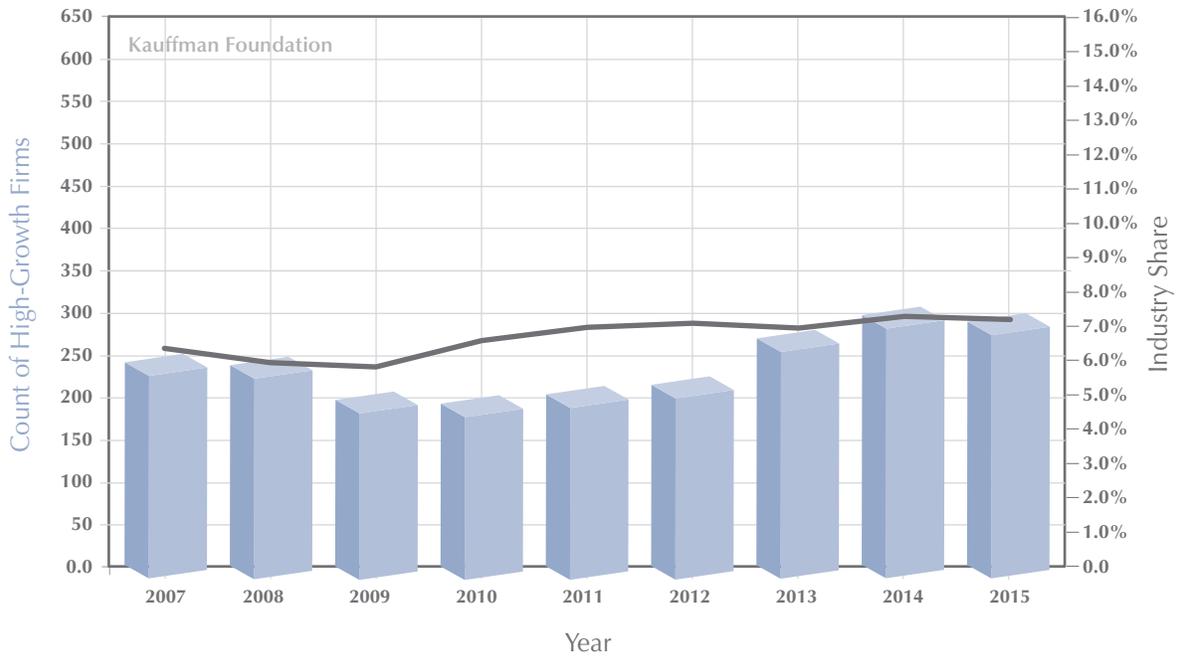
SOURCE: Authors' calculations from Inc. 5000 data. For an interactive version, please see: www.kauffmanindex.org.

Figure 7
Health Industry Profile (2007–2015)—Rank 4 in 2015



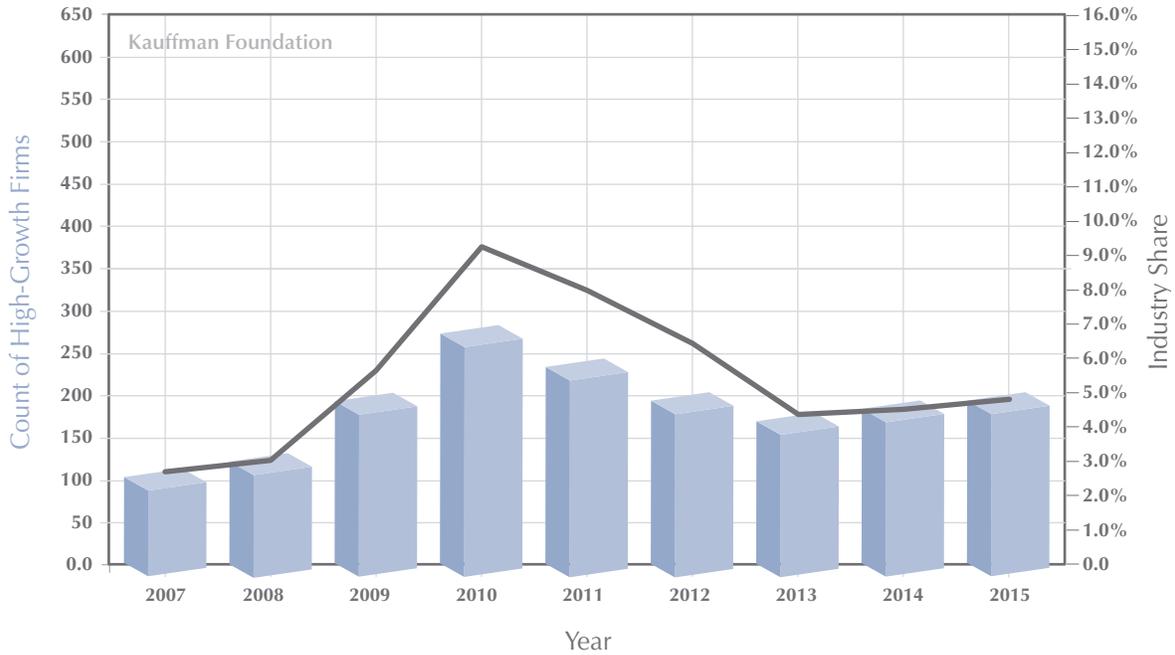
SOURCE: Authors' calculations from Inc. 5000 data. For an interactive version, please see: www.kauffmanindex.org.

Figure 8
Software Industry Profile (2007–2015)—Rank 5 in 2015



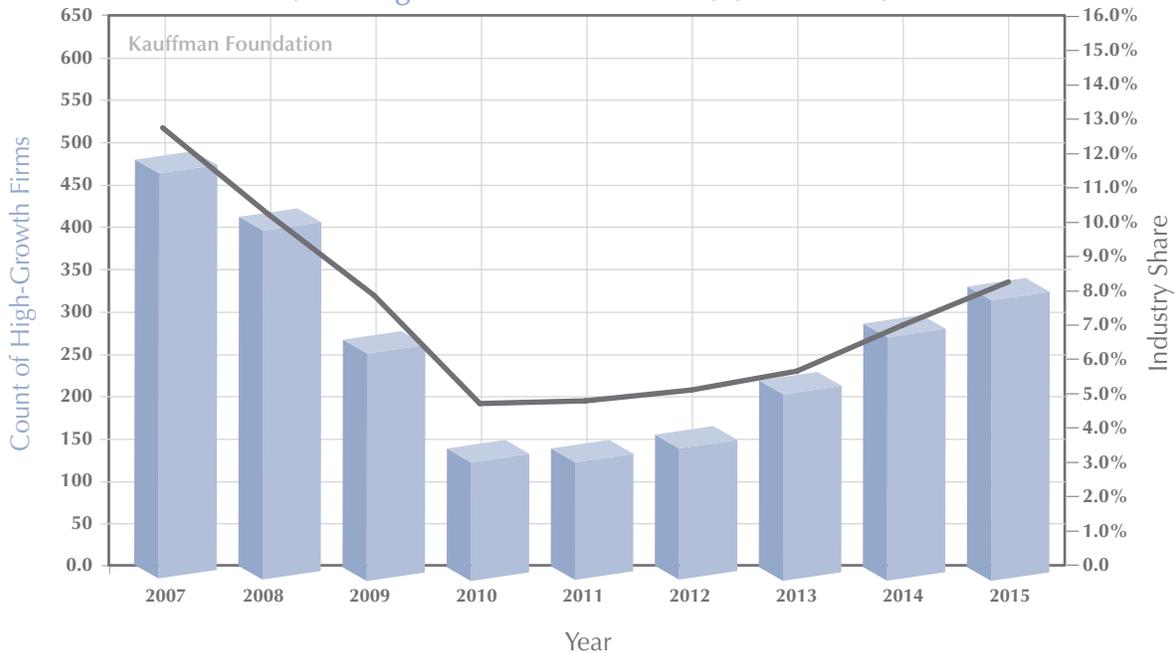
SOURCE: Authors' calculations from Inc. 5000 data. For an interactive version, please see: www.kauffmanindex.org.

Figure 9
Government Services Industry Profile (2007–2015)



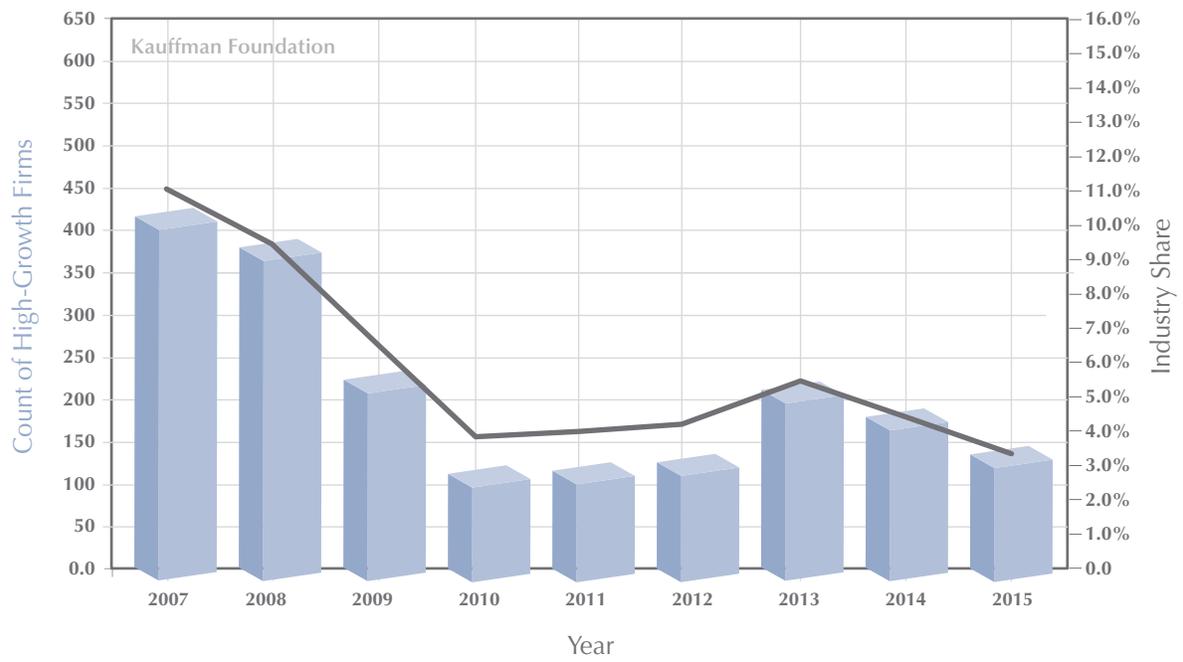
SOURCE: Authors' calculations from Inc. 5000 data. For an interactive version, please see: www.kauffmanindex.org.

Figure 10
Construction and Real Estate Industries Profile
(Housing-Associated Industries) (2007–2015)



SOURCE: Authors' calculations from Inc. 5000 data. For an interactive version, please see: www.kauffmanindex.org.

Figure 11
 Manufacturing and Computer Hardware Industries Profile
 ("Maker" Industries) (2007–2015)



SOURCE: Authors' calculations from Inc. 5000 data. For an interactive version, please see: www.kauffmanindex.org.

Appendix: National Data, Select Industry Profiles, and Charts

National Profile

United States of America

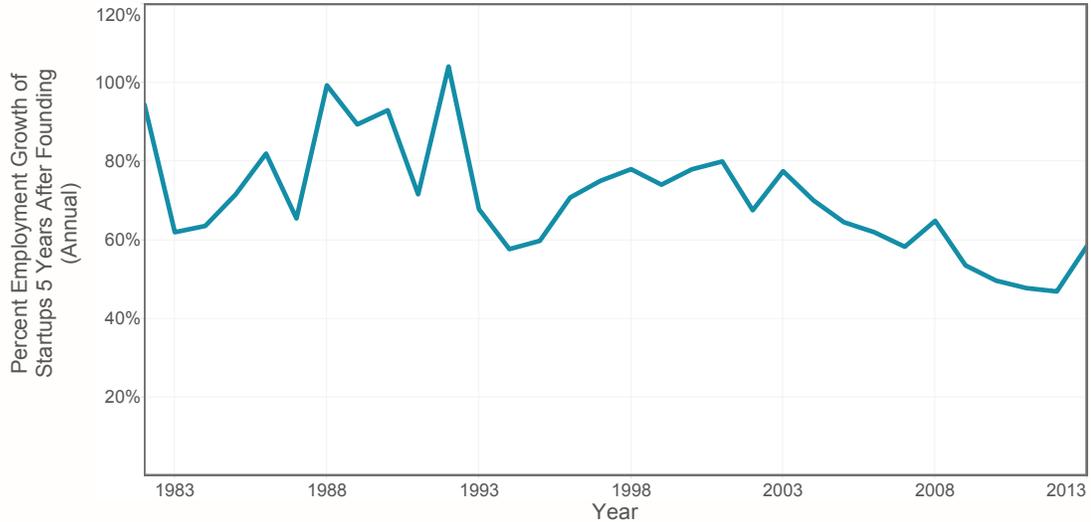
Rate of Startup Growth

| 2016 Component | 2015 Component |
|----------------|----------------|
| 58.54% | 46.90% |

Measures how much startups have grown as a cohort, on average, five years after founding - measured by change in employment.

Source: Author calculations from BDS. Yearly measure.

Rate of Startup Growth



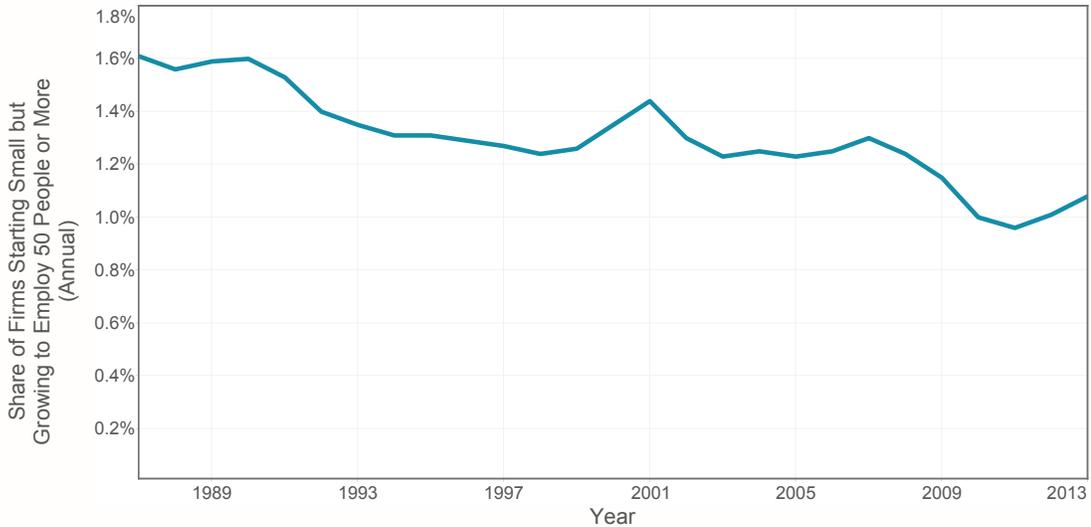
Share of Scaleups

| 2016 Component | 2015 Component |
|----------------|----------------|
| 1.08% | 1.01% |

Measures the number of firms that started small but grew to employ fifty people or more by their tenth year of operation as a percentage of all employer firms ten years and younger.

Source: Author calculations from BDS. Yearly measure.

Share of Scaleups



High-Growth Company Density

| 2016 Component | 2015 Component |
|----------------|----------------|
| 79.3 | 80.5 |

Measures the number of private businesses with at least \$2 million in annual revenue reaching three years of 20 percent annual revenue growth normalized by total business population.

Source: Author calculations from BDS and Inc. 500/5000. Yearly measure.

High-Growth Company Density

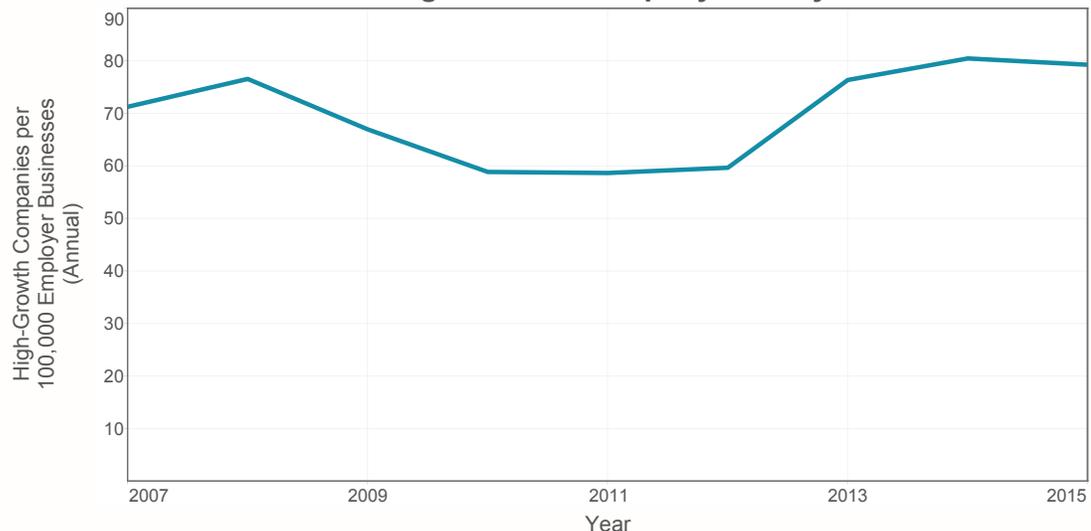
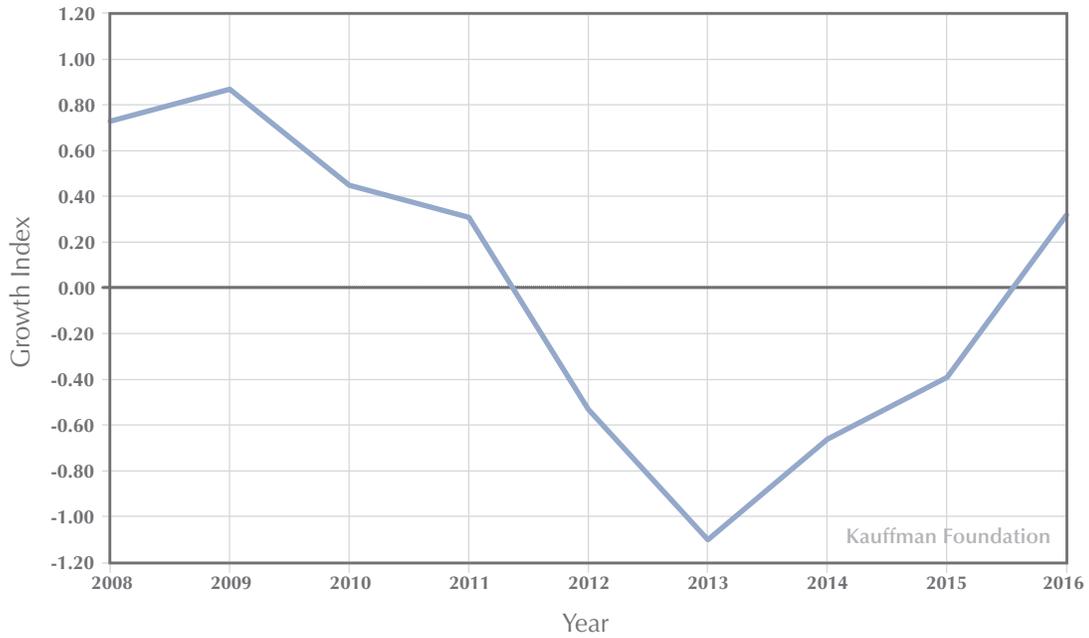


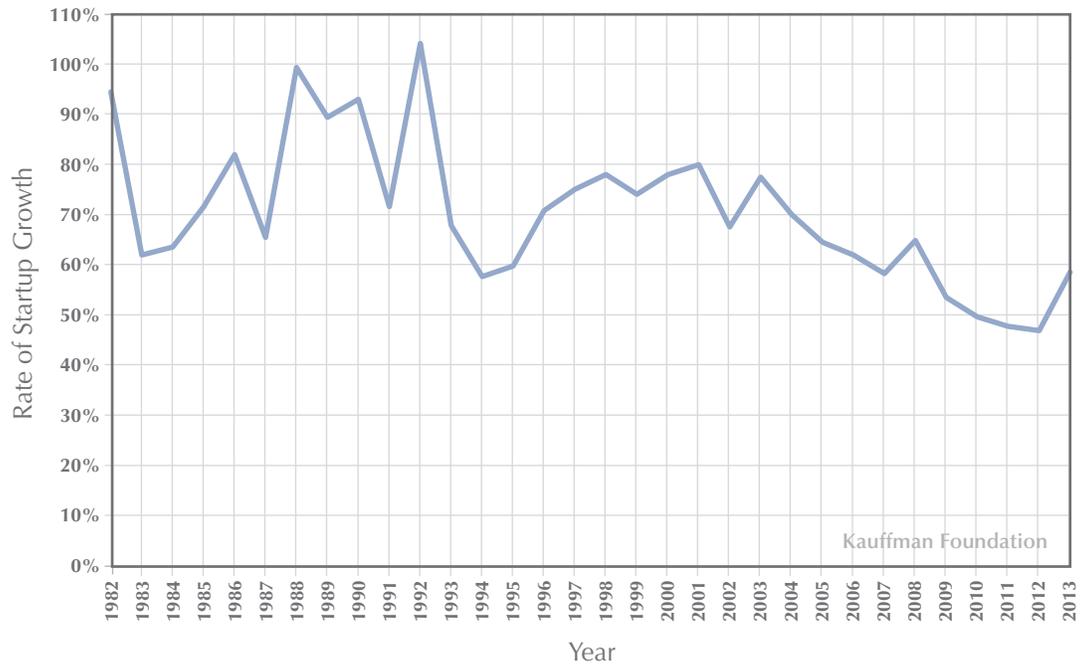
Figure 1
Kauffman Index of Growth Entrepreneurship (2008–2016)



SOURCE: Authors' calculations using the BDS and Inc. 500|5000 data. For an interactive version, please see: www.kauffmanindex.org.

| Growth Entrepreneurship Components | | | | |
|------------------------------------|-------|------------------------|-------------------|-----------------------------|
| Index Year | Index | Rate of Startup Growth | Share of Scaleups | High-Growth Company Density |
| 2008 | 0.73 | 64.51% | 1.23% | 71.3 |
| 2009 | 0.87 | 61.96% | 1.25% | 76.6 |
| 2010 | 0.45 | 58.27% | 1.30% | 67.0 |
| 2011 | 0.31 | 64.86% | 1.24% | 58.9 |
| 2012 | -0.53 | 53.51% | 1.15% | 58.7 |
| 2013 | -1.1 | 49.65% | 1.00% | 59.7 |
| 2014 | -0.66 | 47.75% | 0.96% | 76.4 |
| 2015 | -0.39 | 46.90% | 1.01% | 80.5 |
| 2016 | 0.32 | 58.54% | 1.08% | 79.3 |

Figure 1A
Rate of Startup Growth (1982–2013)



SOURCE: Authors' calculations using the BDS. For an interactive version, please see: www.kauffmanindex.org.

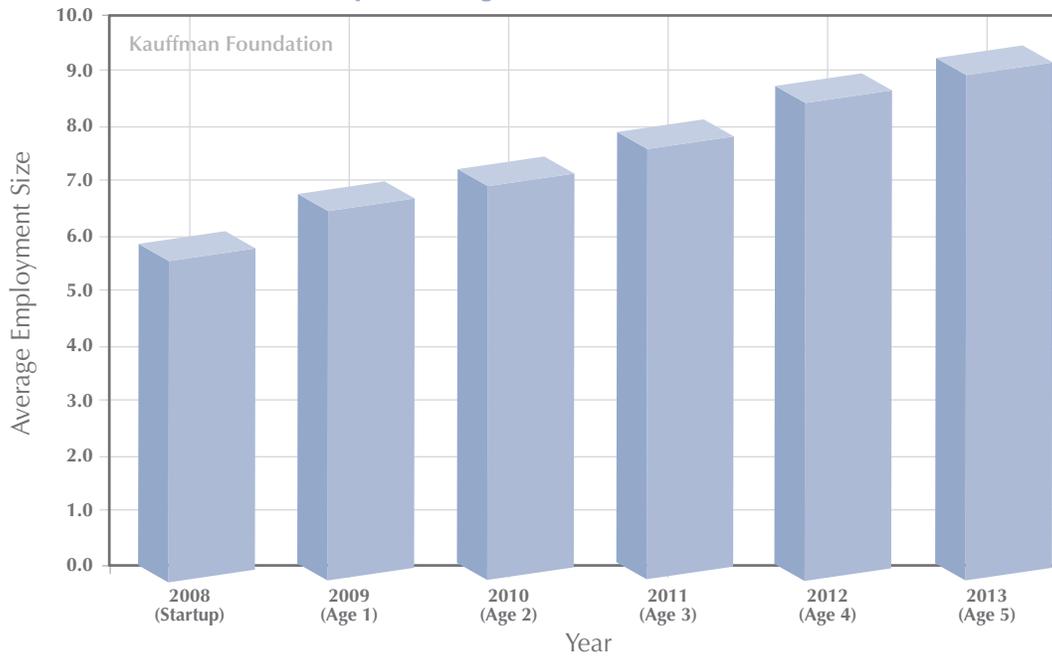


Table 1A

Rate of Startup Growth (1982–2013)

| Year | Rate of Startup Growth | Year | Rate of Startup Growth |
|------|------------------------|------|------------------------|
| 1982 | 94.5% | 1998 | 78.0% |
| 1983 | 62.0% | 1999 | 74.1% |
| 1984 | 63.6% | 2000 | 78.0% |
| 1985 | 71.6% | 2001 | 80.0% |
| 1986 | 82.0% | 2002 | 67.6% |
| 1987 | 65.5% | 2003 | 77.5% |
| 1988 | 99.3% | 2004 | 70.1% |
| 1989 | 89.4% | 2005 | 64.5% |
| 1990 | 93.0% | 2006 | 62.0% |
| 1991 | 71.6% | 2007 | 58.3% |
| 1992 | 104.1% | 2008 | 64.9% |
| 1993 | 67.8% | 2009 | 53.5% |
| 1994 | 57.7% | 2010 | 49.6% |
| 1995 | 59.8% | 2011 | 47.7% |
| 1996 | 70.8% | 2012 | 46.9% |
| 1997 | 75.1% | 2013 | 58.5% |

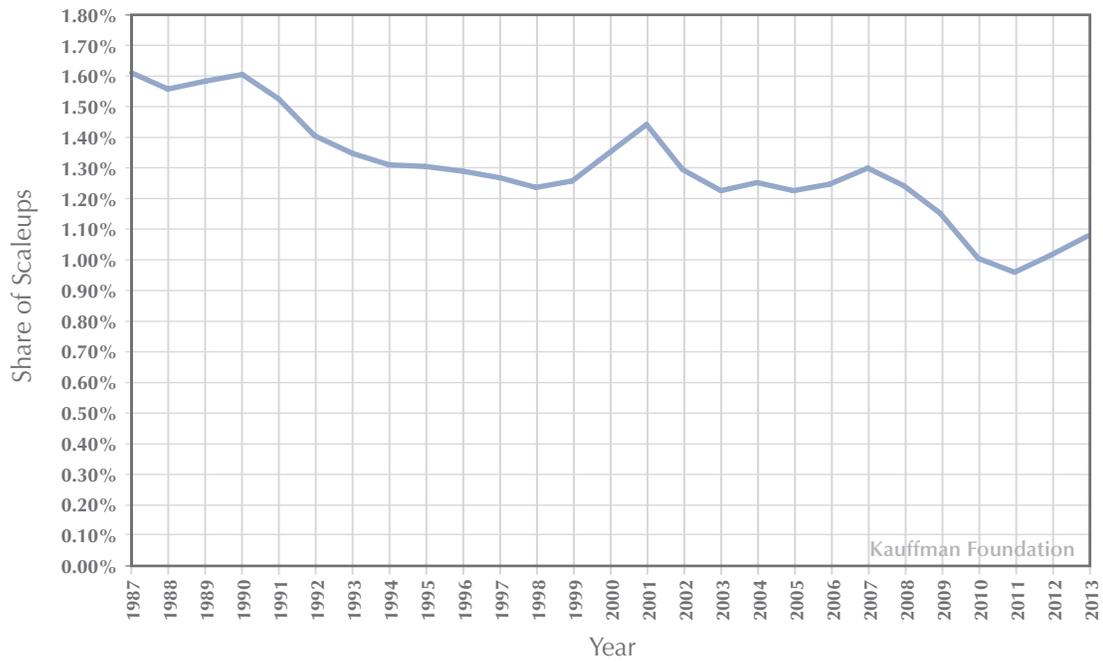
Figure 1B
**Average Size of Surviving Business by Number of Employees
 for Startups Turning Five in 2013, born in 2008**



SOURCE: Authors' calculations using the BDS. For an interactive version, please see: www.kauffmanindex.org.

| Table 1B | |
|--|---|
| Average Size of Surviving Business by Number of Employees for Startups Turning Five in 2013, born in 2008 | |
| Year | Average Employment Size of Surviving Business |
| 2008 (Startup) | 5.8 |
| 2009 (Age 1) | 6.7 |
| 2010 (Age 2) | 7.2 |
| 2011 (Age 3) | 7.8 |
| 2012 (Age 4) | 8.7 |
| 2013 (Age 5) | 9.2 |

Figure 1C
Share of Scaleups (1987–2013)

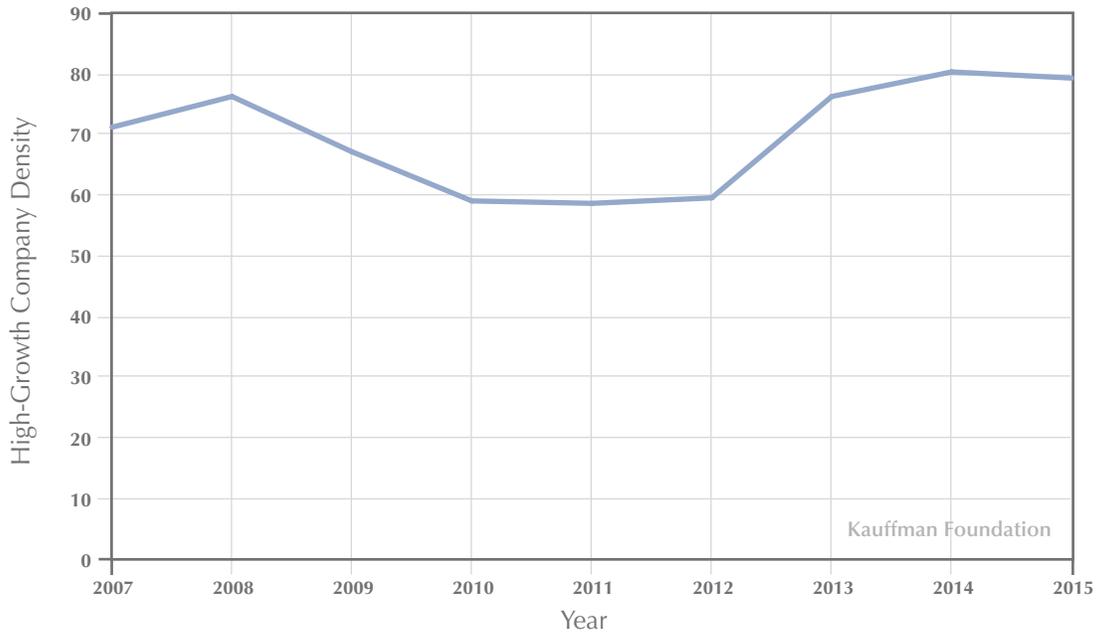


SOURCE: Authors' calculations using the BDS. For an interactive version, please see: www.kauffmanindex.org.



| Year | Share of Scaleups | Year | Share of Scaleups |
|------|-------------------|------|-------------------|
| 1987 | 1.61% | 2001 | 1.44% |
| 1988 | 1.56% | 2002 | 1.30% |
| 1989 | 1.59% | 2003 | 1.23% |
| 1990 | 1.60% | 2004 | 1.25% |
| 1991 | 1.53% | 2005 | 1.23% |
| 1992 | 1.40% | 2006 | 1.25% |
| 1993 | 1.35% | 2007 | 1.30% |
| 1994 | 1.31% | 2008 | 1.24% |
| 1995 | 1.31% | 2009 | 1.15% |
| 1996 | 1.29% | 2010 | 1.00% |
| 1997 | 1.27% | 2011 | 0.96% |
| 1998 | 1.24% | 2012 | 1.01% |
| 1999 | 1.26% | 2013 | 1.08% |
| 2000 | 1.35% | | |

Figure 1D
 High-Growth Company Density (2007–2015)

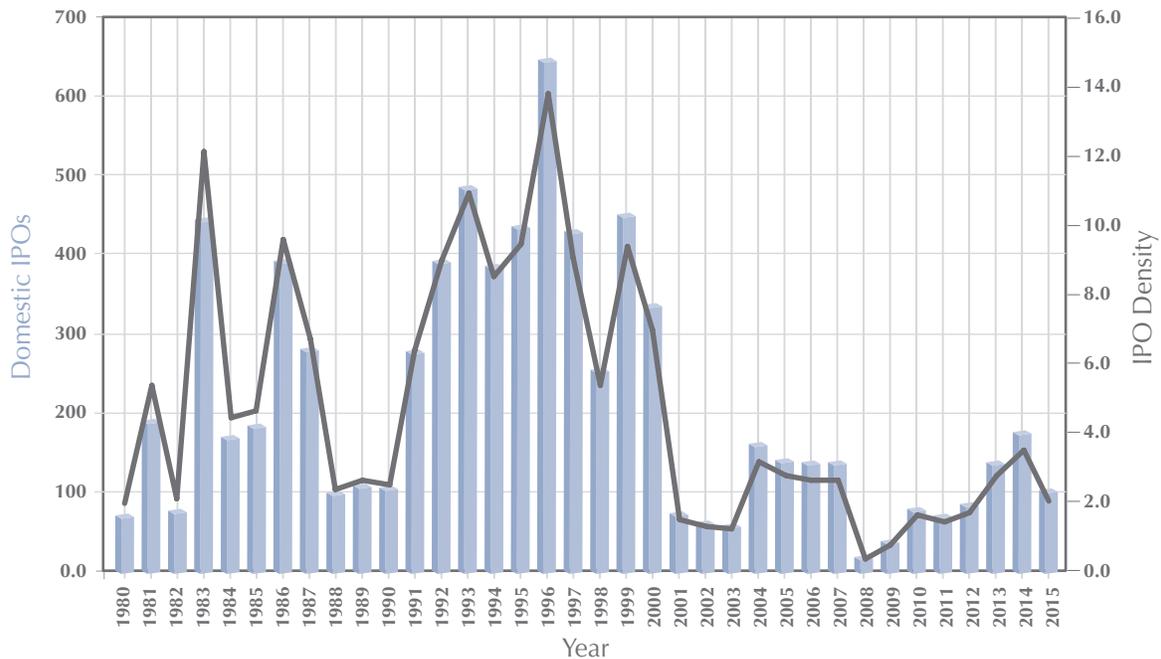


SOURCE: Authors' calculations using the BDS and Inc. 500|5000 data. For an interactive version, please see: www.kauffmanindex.org.



| Year | High-Growth Company Density |
|------|-----------------------------|
| 2007 | 71.3 |
| 2008 | 76.6 |
| 2009 | 67.0 |
| 2010 | 58.9 |
| 2011 | 58.7 |
| 2012 | 59.7 |
| 2013 | 76.4 |
| 2014 | 80.5 |
| 2015 | 79.3 |

Figure 2
 IPOs in the United States Over Time (1980–2015)



SOURCE: Authors' calculations using Jay Ritter's "Initial Public Offerings: Foreign IPOs in the U.S., 1980–2015" and the BDS.

Table 2

IPOs in the United States Over Time (1980–2015)

| Year | Domestic IPOs | IPO Density | Year | Domestic IPOs | IPO Density |
|------|---------------|-------------|------|---------------|-------------|
| 1980 | 70 | 1.9 | 1998 | 256 | 5.3 |
| 1981 | 191 | 5.4 | 1999 | 451 | 9.3 |
| 1982 | 76 | 2.1 | 2000 | 336 | 6.9 |
| 1983 | 446 | 12.1 | 2001 | 74 | 1.5 |
| 1984 | 170 | 4.4 | 2002 | 63 | 1.3 |
| 1985 | 184 | 4.6 | 2003 | 60 | 1.2 |
| 1986 | 392 | 9.6 | 2004 | 160 | 3.1 |
| 1987 | 281 | 6.7 | 2005 | 142 | 2.7 |
| 1988 | 100 | 2.4 | 2006 | 138 | 2.6 |
| 1989 | 110 | 2.6 | 2007 | 138 | 2.6 |
| 1990 | 107 | 2.5 | 2008 | 18 | 0.3 |
| 1991 | 278 | 6.4 | 2009 | 38 | 0.7 |
| 1992 | 393 | 9.0 | 2010 | 80 | 1.6 |
| 1993 | 487 | 10.9 | 2011 | 70 | 1.4 |
| 1994 | 386 | 8.5 | 2012 | 85 | 1.7 |
| 1995 | 436 | 9.4 | 2013 | 139 | 2.7 |
| 1996 | 646 | 13.8 | 2014 | 177 | 3.5 |
| 1997 | 430 | 9.0 | 2015 | 103 | 2.0 |

Table B | Top Five Industries with Highest Share of High-Growth Companies (2015)

| Rank | Industry | High-Growth Companies | Share (%) |
|------|------------------------------|-----------------------|-----------|
| 1 | IT Services | 521 | 13.0% |
| 2 | Advertising & Marketing | 397 | 9.9% |
| 3 | Business Products & Services | 367 | 9.2% |
| 4 | Health | 315 | 7.9% |
| 5 | Software | 289 | 7.2% |

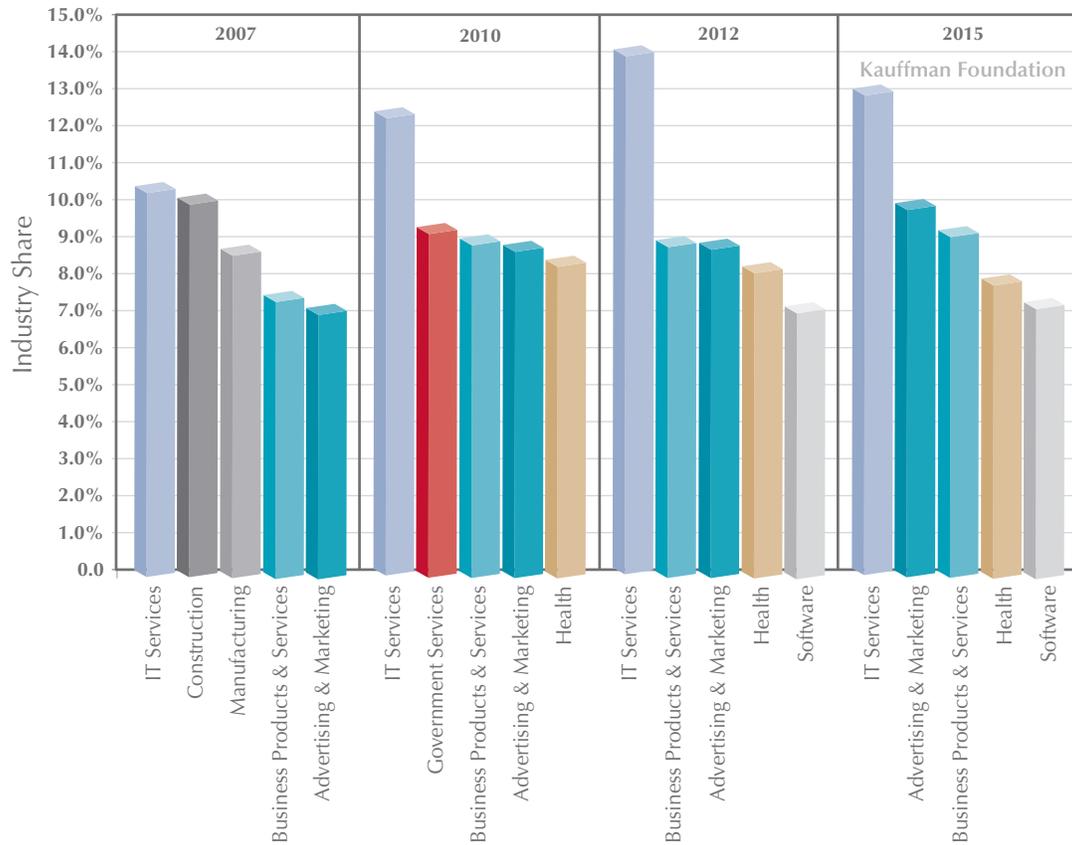
Source: Authors' calculations from Inc. 500|5000 data.

Table C | Industries by Share of High-Growth Companies (2015)

| Rank | Industry | High-Growth Companies | Share (%) |
|------|------------------------------|-----------------------|-----------|
| 1 | IT Services | 521 | 13.0% |
| 2 | Advertising & Marketing | 397 | 9.9% |
| 3 | Business Products & Services | 367 | 9.2% |
| 4 | Health | 315 | 7.9% |
| 5 | Software | 289 | 7.2% |
| 6 | Financial Services | 195 | 4.9% |
| 7 | Construction | 195 | 4.9% |
| 8 | Government Services | 193 | 4.8% |
| 9 | Consumer Products & Services | 188 | 4.7% |
| 10 | Human Resources | 147 | 3.7% |
| 11 | Real Estate | 134 | 3.3% |
| 12 | Retail | 131 | 3.3% |
| 13 | Food & Beverage | 123 | 3.1% |
| 14 | Logistics & Transportation | 113 | 2.8% |
| 15 | Manufacturing | 111 | 2.8% |
| 16 | Telecommunications | 89 | 2.2% |
| 17 | Energy | 88 | 2.2% |
| 18 | Security | 71 | 1.8% |
| 19 | Engineering | 63 | 1.6% |
| 20 | Education | 58 | 1.4% |
| 21 | Insurance | 55 | 1.4% |
| 22 | Travel & Hospitality | 52 | 1.3% |
| 23 | Media | 51 | 1.3% |
| 24 | Environmental Services | 39 | 1.0% |
| 25 | Computer Hardware | 23 | 0.6% |

Source: Authors' calculations from Inc. 500|5000 data.

Figure 3
Top Five Industries with Highest Share of High-Growth Companies
 (2007, 2010, 2012, 2015)



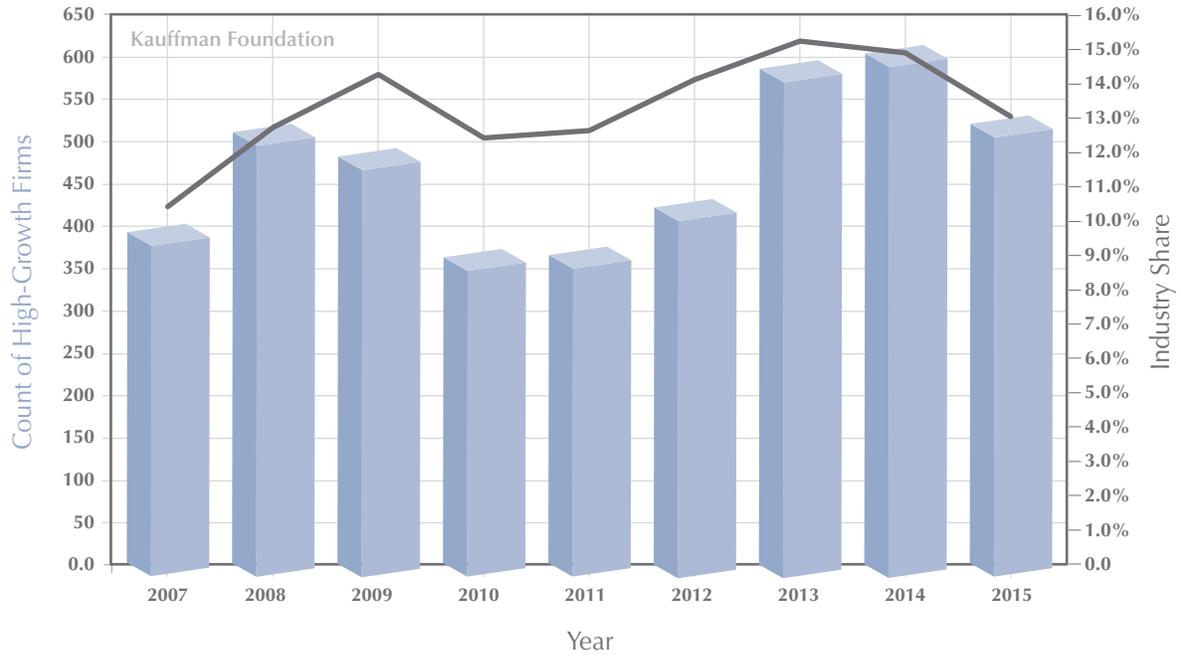
SOURCE: Authors' calculations from Inc. 500|5000 data. For an interactive version, please see: www.kauffmanindex.org.

Table 3

Top Five Industries with Highest Share of High-Growth Companies (2007, 2010, 2012, 2015)

| 2007 | | 2010 | | 2012 | | 2015 | |
|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|------------------------------|----------------|
| Industry | Industry Share |
| IT Services | 10.4% | IT Services | 12.4% | IT Services | 14.1% | IT Services | 13.0% |
| Construction | 10.1% | Government Services | 9.2% | Business Products & Services | 8.9% | Advertising & Marketing | 9.9% |
| Manufacturing | 8.7% | Business Products & Services | 8.9% | Advertising & Marketing | 8.8% | Business Products & Services | 9.2% |
| Business Products & Services | 7.4% | Advertising & Marketing | 8.8% | Health | 8.2% | Health | 7.9% |
| Advertising & Marketing | 7.1% | Health | 8.4% | Software | 7.1% | Software | 7.2% |

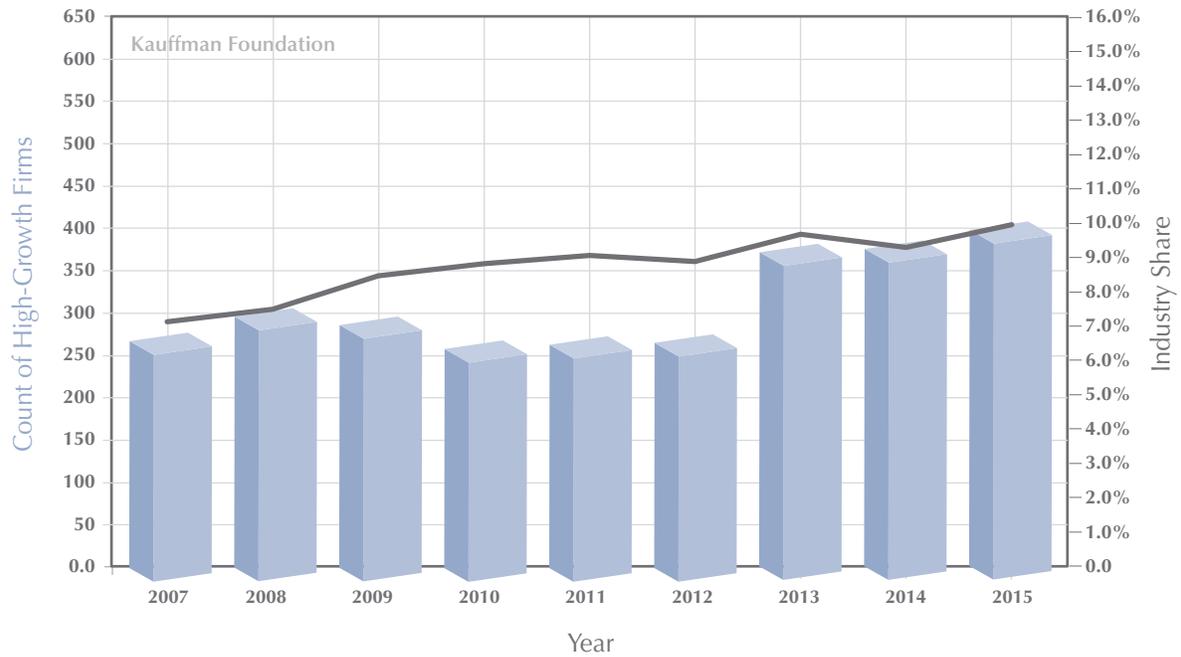
Figure 4
IT Services Industry Profile (2007–2015)—Rank 1 in 2015



SOURCE: Authors' calculations from Inc. 5000 data. For an interactive version, please see: www.kauffmanindex.org.

| Year | High-Growth Companies | Industry Share |
|------|-----------------------|----------------|
| 2007 | 391 | 10.4% |
| 2008 | 509 | 12.7% |
| 2009 | 483 | 14.2% |
| 2010 | 364 | 12.4% |
| 2011 | 366 | 12.6% |
| 2012 | 422 | 14.1% |
| 2013 | 587 | 15.2% |
| 2014 | 604 | 14.9% |
| 2015 | 521 | 13.0% |

Figure 5
Advertising & Marketing Industry Profile (2007–2015)—Rank 2 in 2015

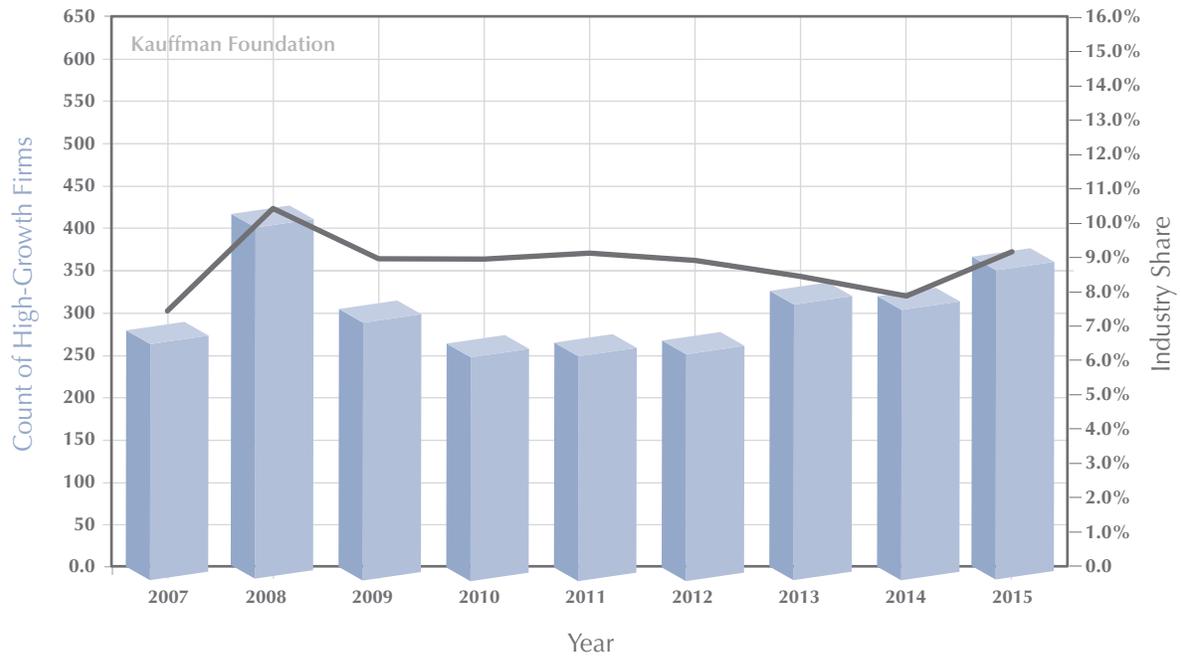


SOURCE: Authors' calculations from Inc. 5000 data. For an interactive version, please see: www.kauffmanindex.org.

| Year | High-Growth Companies | Industry Share |
|------|-----------------------|----------------|
| 2007 | 267 | 7.1% |
| 2008 | 299 | 7.5% |
| 2009 | 286 | 8.4% |
| 2010 | 258 | 8.8% |
| 2011 | 262 | 9.0% |
| 2012 | 265 | 8.8% |
| 2013 | 372 | 9.6% |
| 2014 | 376 | 9.2% |
| 2015 | 397 | 9.9% |

Figure 6

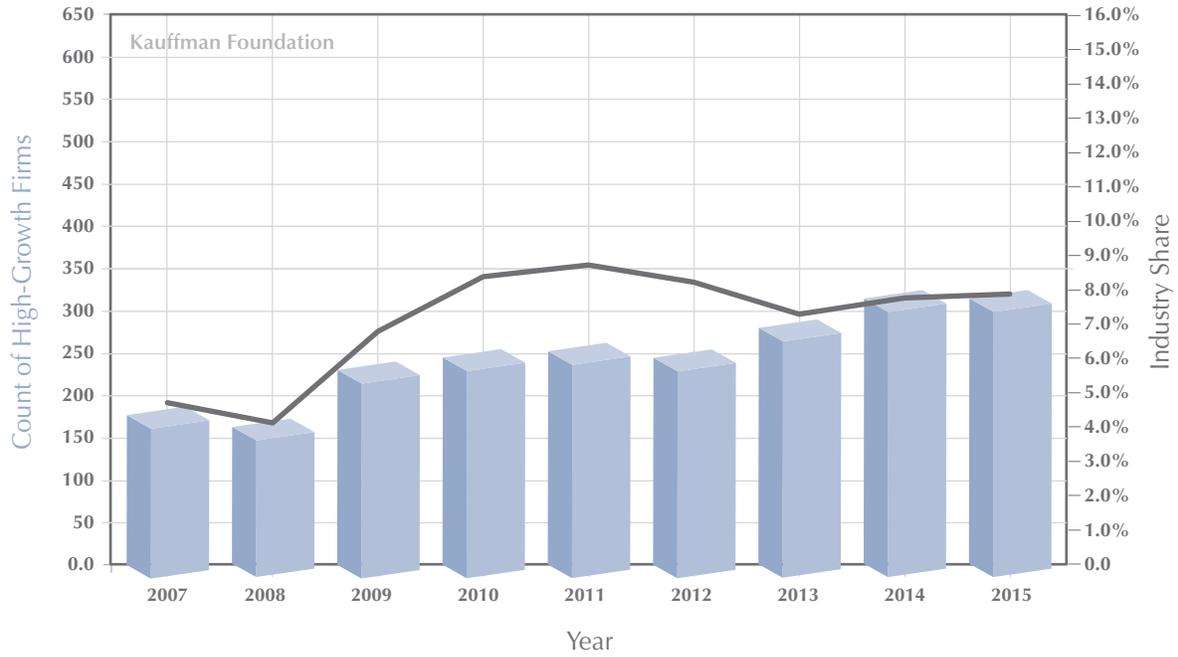
Business Products & Services Industry Profile (2007–2015) — Rank 3 in 2015



SOURCE: Authors' calculations from Inc. 5000 data. For an interactive version, please see: www.kauffmanindex.org.

| Year | High-Growth Companies | Industry Share |
|------|-----------------------|----------------|
| 2007 | 280 | 7.4% |
| 2008 | 418 | 10.4% |
| 2009 | 304 | 9.0% |
| 2010 | 263 | 8.9% |
| 2011 | 265 | 9.1% |
| 2012 | 267 | 8.9% |
| 2013 | 326 | 8.4% |
| 2014 | 320 | 7.9% |
| 2015 | 367 | 9.2% |

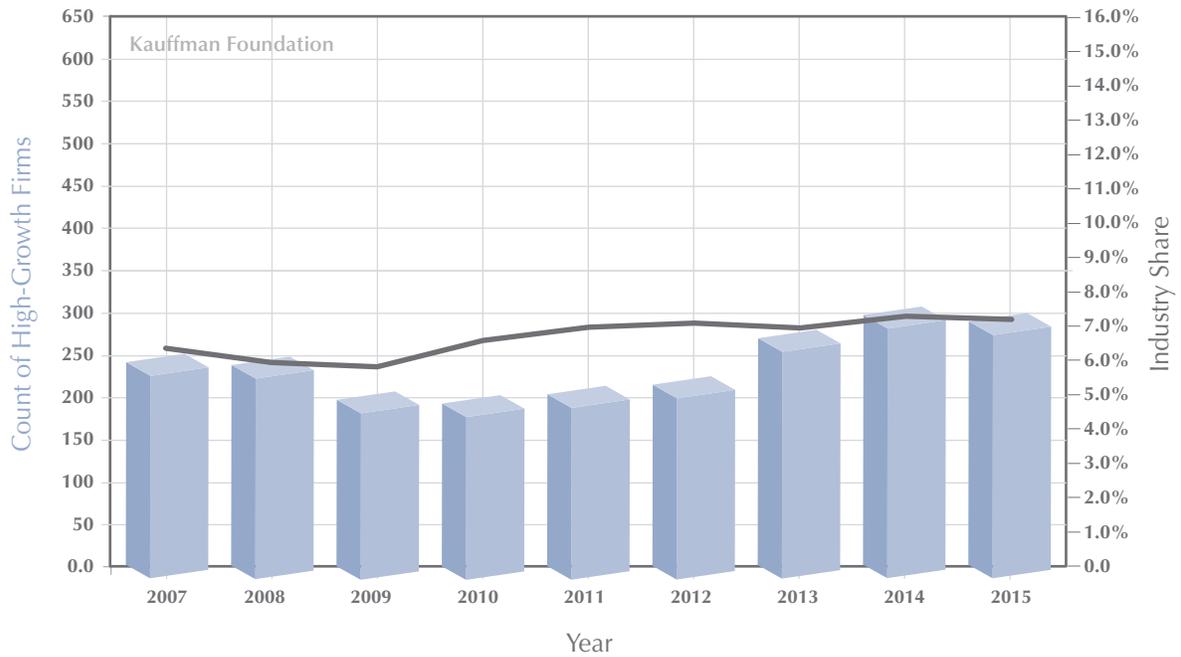
Figure 7
Health Industry Profile (2007–2015)—Rank 4 in 2015



SOURCE: Authors' calculations from Inc. 5000 data. For an interactive version, please see: www.kauffmanindex.org.

| Table 7 | | |
|-------------------------------------|-----------------------|----------------|
| Health Industry Profile (2007–2015) | | |
| Year | High-Growth Companies | Industry Share |
| 2007 | 177 | 4.7% |
| 2008 | 165 | 4.1% |
| 2009 | 230 | 6.8% |
| 2010 | 246 | 8.4% |
| 2011 | 253 | 8.7% |
| 2012 | 246 | 8.2% |
| 2013 | 281 | 7.3% |
| 2014 | 315 | 7.7% |
| 2015 | 315 | 7.9% |

Figure 8
Software Industry Profile (2007–2015) – Rank 5 in 2015



SOURCE: Authors' calculations from Inc. 5000 data. For an interactive version, please see: www.kauffmanindex.org.

| Table 8 | | |
|---------------------------------------|-----------------------|----------------|
| Software Industry Profile (2007–2015) | | |
| Year | High-Growth Companies | Industry Share |
| 2007 | 240 | 6.4% |
| 2008 | 239 | 6.0% |
| 2009 | 198 | 5.8% |
| 2010 | 194 | 6.6% |
| 2011 | 203 | 7.0% |
| 2012 | 213 | 7.1% |
| 2013 | 269 | 7.0% |
| 2014 | 297 | 7.3% |
| 2015 | 289 | 7.2% |

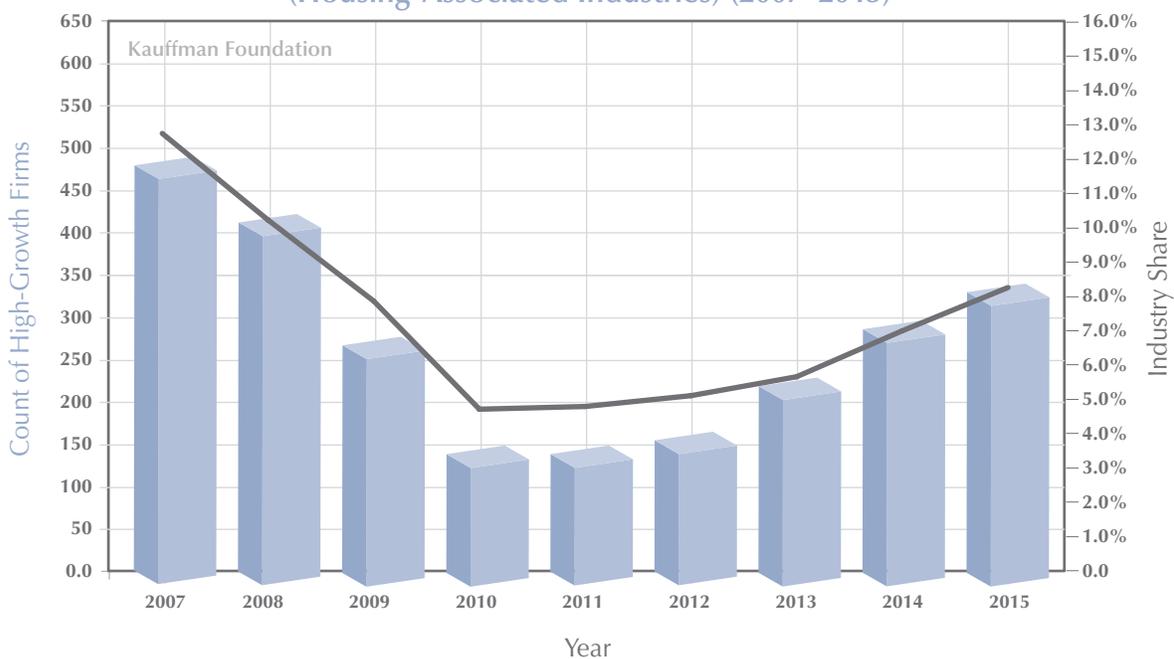
Figure 9
Government Services Industry Profile (2007–2015)



SOURCE: Authors' calculations from Inc. 5000 data. For an interactive version, please see: www.kauffmanindex.org.

| Year | High-Growth Companies | Industry Share |
|------|-----------------------|----------------|
| 2007 | 102 | 2.7% |
| 2008 | 122 | 3.0% |
| 2009 | 192 | 5.7% |
| 2010 | 272 | 9.2% |
| 2011 | 232 | 8.0% |
| 2012 | 193 | 6.4% |
| 2013 | 169 | 4.4% |
| 2014 | 184 | 4.5% |
| 2015 | 193 | 4.8% |

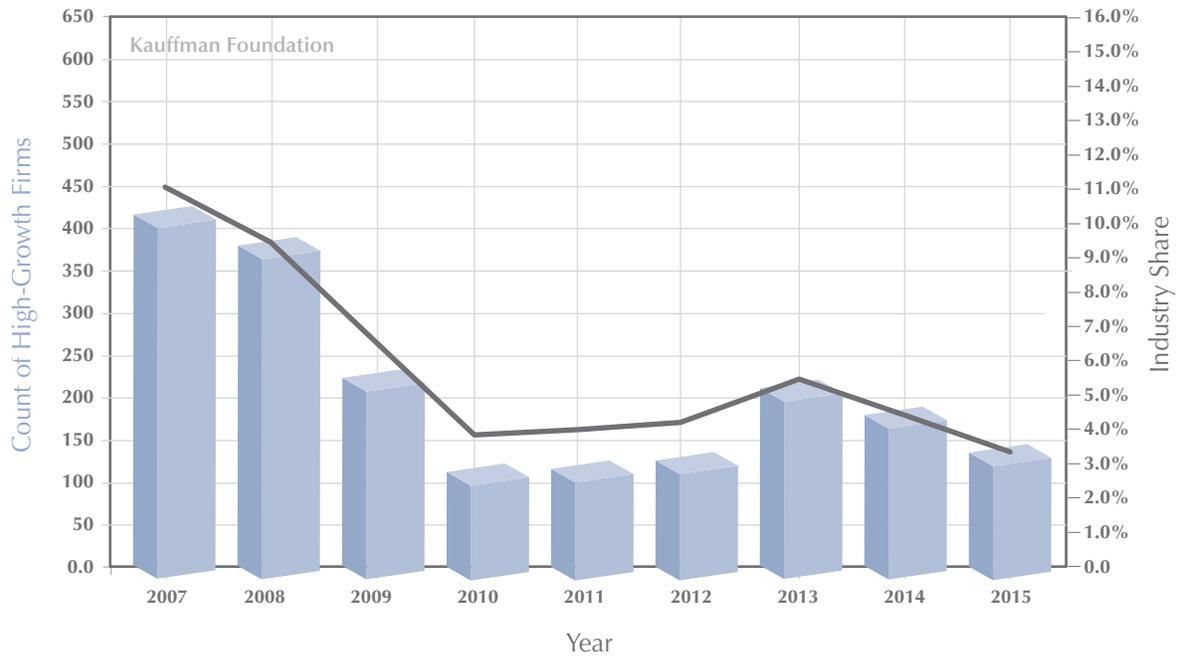
Figure 10
**Construction and Real Estate Industries Profile
 (Housing-Associated Industries) (2007–2015)**



SOURCE: Authors' calculations from Inc. 5000 data. For an interactive version, please see: www.kauffmanindex.org.

| Year | High-Growth Companies | Industry Share |
|------|-----------------------|----------------|
| 2007 | 479 | 12.7% |
| 2008 | 411 | 10.2% |
| 2009 | 266 | 7.8% |
| 2010 | 138 | 4.7% |
| 2011 | 138 | 4.7% |
| 2012 | 153 | 5.1% |
| 2013 | 218 | 5.6% |
| 2014 | 285 | 7.0% |
| 2015 | 329 | 8.2% |

Figure 11
Manufacturing and Computer Hardware Industries Profile
 (“Maker” Industries) (2007–2015)



SOURCE: Authors' calculations from Inc. 5000 data. For an interactive version, please see: www.kauffmanindex.org.

| Table 11 | | |
|--|-----------------------|----------------|
| Manufacturing and Computer Hardware Industries Profile (“Maker” Industry) (2007–2015) | | |
| Year | High-Growth Companies | Industry Share |
| 2007 | 416 | 11.0% |
| 2008 | 379 | 9.4% |
| 2009 | 222 | 6.5% |
| 2010 | 111 | 3.8% |
| 2011 | 116 | 4.0% |
| 2012 | 126 | 4.2% |
| 2013 | 211 | 5.5% |
| 2014 | 179 | 4.4% |
| 2015 | 134 | 3.3% |

Methodology and Framework



Methodology and Framework

In this part of the report, we discuss the methodology and framework for the Growth Entrepreneurship Index across all geographic levels: national, state, and metropolitan area. While growth entrepreneurship is a new topic for the Kauffman Index, it’s an area the Kauffman Foundation has spent decades exploring and considering.

Growth entrepreneurship is associated with terms like gazelles, tech innovation, and unicorns, as well as entrepreneurship “inputs” such as venture capital, angel investors, accelerators, and a host of other topics. Yet, growth entrepreneurship happens in non-tech industries and in companies that did not access these typically thought-of inputs (Motoyama et. al 2013; Ritter 2016; Motoyama and Danley 2012; Moreira 2015). This distinction of inputs vs. outputs is an important one, because, in the current Growth Entrepreneurship Index, we only attempt to capture outputs associated with growth entrepreneurship, not input resources. While tracking inputs is absolutely critical and can become a part of future Kauffman Indices, at the current time the data available for inputs remains somewhat fragmented and not readily available across all geographies covered in the Kauffman Index. Many promising areas of research and expansion are under way, such as the Seed Accelerator Ranking Project, the Halo Report, CB Insights, Crunchbase, and many more.

Definitions of Growth Entrepreneurship Index Components

The Growth Entrepreneurship Index is calculated based on three components: the Rate of Startup Growth, the Share of Scaleups, and the High-Growth Company Density. In this section, we provide detailed definitions of each one of these components.



Component A: Rate of Startup Growth

The Rate of Startup Growth component of the Kauffman Index of Growth Entrepreneurship uses U.S. Census Bureau data from the Business Dynamics Statistics to measure the average change in employment size of all startups—defined here as new employer firms—from the year of founding to their fifth year of operation. It captures all new U.S. employer firms, regardless of industry. This is a yearly estimate where startups are new employer firms that are younger than one year old in a given year. Data for this measure are available from 1982 to 2013, the latest year for which information on five-year-old companies is published.

This proxy measure examines cohorts of new businesses, a common practice among researchers examining business demography. Much like cohorts of people born around the same time—think Baby Boomers or Millennials—exhibit similar traits, businesses are imprinted by the economic environment they enter into

(Moreira 2015). Utilizing standard measures about a cohort as it ages is meant to help track the broad health of startups as they age, much like we track the weight and height of children as they grow. This measure is based on previous work by the Kauffman Foundation examining average company size by cohort over time to gauge U.S. job creation and the growth trajectories of new firms (Reedy and Litan 2011).

Because of data limitations, the Rate of Startup Growth looks at the change in size of the broad new firm cohort—all startups on one end and *only surviving firms* at the other end. Thus, this indicator has survivor bias. While we would like to look at average growth within each firm, we are only able to look across the whole cohort. This leads to a bias because all new firms are included in the calculation of average size during their years of birth, but only surviving firms are included on the calculation of average size by year five. We know that employment and growth, while presented here as an average, are more typically highly skewed amongst individual firms.

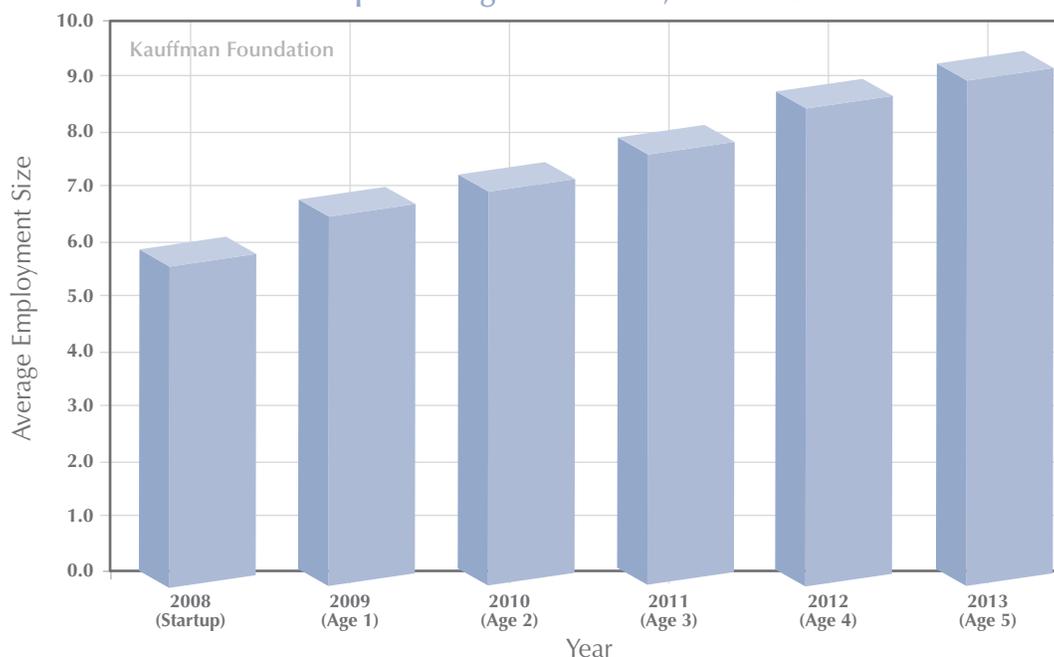
To exemplify this calculation by cohort, please see Figure 1B below. The Rate of Startup Growth for the most recent year with data available (2013), was 58.5 percent. This indicates that the average U.S. startup from 2008 (which is now five years old in 2013, the latest year for which data are available) grew from 5.8 employees when founded to 9.2 employees after five years of operation.



Rate of Startup Growth

- Proxy measure of business growth and startup traction across young businesses.
- Measures the average growth of cohorts of new employer firms from the year they were founded through their fifth year of operation.
- Calculates growth by comparing the average size of all startups from a given year to the average size of surviving, young companies in year five of operation. All industries are included in this measure.
- Data based on author calculations from the U.S. Census Bureau’s Business Dynamics Statistics.
- What the number means:
 - For example, the Rate of Startup Growth was 70.3 percent for Colorado in the 2016 Index. That means that, on average, Colorado companies turning five years old have grown 70.3 percent since their founding, from 4.7 average employees at the time of founding to 8.0 average employees by year five.

Figure 1B
Average Size of Surviving Business by Number of Employees for Startups Turning Five in 2013, born in 2008



SOURCE: Authors’ calculations using the BDS. For an interactive version, please see: www.kauffmanindex.org.



Share of Scaleups

- Proxy measure of how many startups become scaleups.
- Measures the percentage of surviving companies that become medium-sized businesses or larger in their first ten years of operation, but did not start in that size category. All industries are included on this measure.
- Medium-sized or larger companies are defined as firms having fifty employees or more.
- Data based on author calculations from the U.S. Census Bureau’s Business Dynamics Statistics.
- What the number means:
 - For example, the United States Share of Scaleups was 1.1 percent in the 2016 Index. That means approximately 1,100 out of every hundred thousand companies ten years and younger started small and became medium-sized businesses with fifty employees or more.

The downward trend apparent in this measure is consistent with other research also based on Census Bureau data, which has found falling levels of economic dynamism in the United States (Decker et al. 2015). The Census Bureau data remains the most comprehensive time series on firms available on the U.S. economy; however, in an effort to balance perspectives on growth entrepreneurship, a secondary source—Inc. 500|5000 data—was utilized in the creation of component C—High-Growth Company Density.



Component B: Share of Scaleups

The importance of “scaleups”—in addition to startups—has been highlighted by researchers such as Dan Isenberg (2012) and practitioners such as Brad Feld (2013). While

measuring scaleups is difficult and no consensus exists, “scaleups” as a concept appears to have coalesced around capturing growth after the startup process; and as a means of emphasizing the important role of growth within the broader concept of the entrepreneurial process.

The second component of the Growth Index attempts to measure scaleups. The Share of Scaleups is a yearly proxy measure calculated from the U.S. Census Bureau’s Business Dynamics Statistics firm data, and it calculates the number of scaleups as a percentage of all firms ten years and younger. We define scaleups as businesses that were born small but grew to employ fifty or more people in their first ten years of operation. We calculate this proxy number of scaleups by looking at all firms younger than ten years old and at least one year old (i.e., not startups) with fifty employees or more, and controlling it for all new firms founded in the past ten years that started out with fifty or more employees. We then calculate the Share of Scaleups as the number of scaleups divided by the total number of firms ten years and younger. Our size cutoffs for medium and large firms come from the European Commission’s definition.⁶



Component C: High-Growth Company Density

Each of the first two components for the Growth Entrepreneurship Index is based on U.S. Census Bureau data and has different elements of firm age incorporated into its construction. Our third and final component for the Growth Entrepreneurship Index—High-Growth Company Density—attempts to provide data from an alternative source—the Inc. 500|5000 annual list of high-growth companies—and to look at *private* firms more broadly, not just those companies that are young or small.

Inc. magazine has been compiling the Inc. 500 list every year since 1982, and some of the firms included on the lists have grown further to become Fortune 500 companies and experience initial public offerings and/or acquisitions. *Inc.* magazine added the Inc. 5000 list in 2007. To achieve wide geographic coverage of companies from year-to-year for the Kauffman Index, we limit our analysis to the years after the implementation of the Inc. 5000 list.

At the higher section of the distribution, Inc. high-growth companies have up to multi-billion-dollar revenues

6. European Union (2003): Commission Recommendation of 6 May 2003 concerning the definition of micro, small, and medium-sized enterprises (Text with EEA relevance) (notified under document number C(2003) 1422). <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32003H0361>.



High-Growth Company Density

- Proxy measure of number of high-growth companies by total business population.
- High-growth companies are defined as private businesses with at least \$2 million dollars in annual revenue with 20 percent annualized revenue growth over a three-year period. There is no age requirement on this indicator. The age of firms spans a wide range, although they skew young.
- Companies in this dataset have up to multi-billion-dollar revenues and growth rates as high as tens of thousands percent. High-growth companies on this dataset have included prominent businesses like Facebook, Go Pro, Microsoft, Oracle, and Zappos, as well as numerous high-growth businesses under the public radar.
- Data based on author calculations from the Inc. 500|5000 private dataset of fastest-growing companies in the United States and on business population data from the U.S. Census Bureau's Business Dynamics Statistics.
- What the number means:
 - For example, the 2016 Index High-Growth Company Density for the New York metropolitan area was 84.7. That means that, for every 100,000 employer business in the New York metro area, there were 84.7 high-growth firms.

and growth rates of many orders of magnitude after three years. At the lower section, the data have been filtered by the authors to only include firms with at least 20 percent annualized growth over three years and \$2 million dollars in annual revenue by the third year of growth. Applying a consistent growth threshold to the list allows us to track trends in the population of Inc. 500|5000 companies over time. These firms come from a wide range of industries, from high-tech to everyday retailers. Examples of companies on the Inc. 500|5000 list have included “stereotypical” high-growth tech firms, such as Facebook, Microsoft, Oracle, Go Pro, and Zappos, as well as firms in less “top-of-mind” industries, such as Domino’s Pizza, Planet Fitness, and Jamba Juice (Motoyama and Danley 2012). While Inc. firms are arguably not fully representative of all U.S. high-growth companies, it is one of the few datasets that allows us to historically and

reliably track trends of revenue-focused high-growth in the country at the national, state, and metro levels.

For calculating the High-Growth Company Density, we started with the 5000-company list of high-growing private companies curated by *Inc.* magazine based on the applications received through its selection process. We cut the list down to include only firms with at least 20 percent annualized growth over a three-year period—which compounds to 72.8 percent after the three years—and at least \$2 million dollars in annual revenue. This growth cutoff is based on the recommended levels put forward by the OECD’s Entrepreneurship Indicators project. After imposing this growth threshold—which excludes usually between 20 and 40 percent of the 5,000 firms on the Inc. list in a given year—we are able to look at how the number of U.S. high-growth firms fluctuates over time and by geography. The last step in the creation of the High-Growth Company Density measure is to normalize the number of companies from the narrowed-down Inc. 5000 list by the population of total employer firms in a given geography as measured by the U.S. Census Bureau’s Business Dynamics Statistics (BDS). While the Inc. list goes up to 2015, the latest data available on the BDS goes up to 2013. As such, we normalize Inc. numbers from 2015 and 2014 against the total firm population from BDS for 2013.

The High-Growth Company Density has no upper-bound restriction on firm age, though it does require firms to be at least three years-old. As such, the age of high-growth firms spans a wide range, although these firms skew young. A plurality of high-growth companies (31.5 percent) are aged between five and seven years old, and 59.1 percent are ten years old and younger.

This measure is based on previous research by the Kauffman Foundation examining the geography of Inc. 500 companies’ over time (Motoyama and Danley 2012). It also is based on the entrepreneurship fluidity measure suggested by our Kauffman Foundation colleagues Stangler and Bell-Masterson (2015).

Calculating the Kauffman Index of Growth Entrepreneurship

The Kauffman Index of Growth Entrepreneurship presents a novel index bringing together different measures of business growth in the United States—across national, state, and metropolitan area levels. It is an equally weighted index of three normalized measures of growth: i) the Rate of Startup Growth, calculated as how much startups have grown as a cohort, on average, after five years of founding—measured by change in employment; ii) the Share of Scaleups, which is the number of firms that started small but grew to become

ventures employing fifty people or more by their tenth year of operation as a percentage of all firms ten years and younger; and iii) the High-Growth Company Density of a region, measured as the number of private businesses with at least \$2 million in annual revenue reaching three years of 20 percent annualized revenue growth normalized by total business population.

Each of these measures is normalized by subtracting the mean and dividing by the standard deviation for that measure (i.e., creating a z-score for each variable).⁷ This creates a comparable scale for including the three measures in the Growth Entrepreneurship Index. We use national annual estimates from 2007 to the latest year available (2015) to calculate the mean and standard deviations for the component based on the Inc. 500|5000 data. Similarly, we use national annual numbers from 2005 to the latest year available (2013) to calculate the mean and standard deviation for the BDS-based components of the Index. The same normalization method is used for all three geographical levels—national, state, and metropolitan area—for comparability and consistency over time.

The components we use for the Growth Entrepreneurship Index are all annual numbers across national, state, and metro-level indicators (e.g., there were no moving averages calculations).

We recognize “growth entrepreneurship” can be defined and measured in multiple different ways. For instance, see Siegel, R. et al. (1993); Birch and Medoff (1994); Kirchoff (1994); Stangler (2010); Kedrosky (2013); and Guzman and Stern (2016). We also understand there are other approaches to the concept, and welcome conversations on the topic as we further explore indicators of Growth Entrepreneurship.

Data Sources and Component Measures

In this section, we discuss the underlying data sources used to calculate each of the components of the Growth Entrepreneurship Index.

Rate of Startup Growth and Share of Scaleups

To calculate the Rate of Startup Growth and Share of Scaleups we use one firm-level dataset, the U.S. Census

Bureau’s Business Dynamics Statistics (BDS). The BDS is constructed using administrative payroll tax records from the Internal Revenue Service (IRS), and covers all employer businesses in the United States (approximately 5 million). The BDS data present, among other things, numbers of firms tabulated by employment size, by firm age, and by geography (national, state, and metropolitan area). We use that data to calculate the measures used for both Rate of Startup Growth and Share of Scaleups.

The BDS has national, state, and metro-level data breakdowns. The metro data geographical coverage is based on the Office of Management and Budget (OMB) definitions for metropolitan areas from December 2009.

Because the BDS is based on administrative data covering the universe of employer businesses, sampling concerns like standard errors and confidence intervals are not applicable. Nonetheless, nonsampling errors still could occur. These could be caused, for example, by data entry issues with the IRS payroll tax records or by businesses submitting incorrect employment data to the IRS. However, these are probably randomly distributed and are unlikely to cause significant biases in the data. Please see Jarmin and Miranda (2002) for a complete discussion of potential complications on the dataset caused by changes in the administrative data on which the BDS is based.

High-Growth Company Density

To calculate High-Growth Company Density, we use two datasets: one to track high-growth companies (as measured by revenue) and one to track the population of employer firms in the United States.

To track the population of employer firms in the United States, we use the U.S. Census Bureau’s Business Dynamics Statistics (BDS). The BDS is constructed using administrative payroll tax records from the Internal Revenue Service (IRS), and covers all employer businesses in the United States (approximately 5 million).

To track high-growth companies, we use data from an alternative source—the Inc. 500|5000 annual list of high-growth companies—to look at private firms regardless of age, not just those companies which are young or small. The data comes from *Inc.* magazine and is presented here in aggregate format as a derivative report and product.

Inc. magazine has been compiling the Inc. 500 list every year since 1982, and some of the firms included on the lists have grown further to become Fortune 500

7. This is one of the normalization methods recommended by the OECD and the Joint Research Centre from the European Commission in the *Handbook on Construction Composite Indicators* (2008).

companies and experience initial public offerings and/ or acquisitions. *Inc.* magazine added the Inc. 5000 list in 2007. To achieve wide geographic coverage of companies from year-to-year for the Kauffman Index, we limit our analysis to the years after the implementation of the Inc. 5000 list.

At the higher section of the distribution, Inc. high-growth companies have up to multi-billion-dollar revenues and growth rates of many orders of magnitude after three years. At the lower section, the data have been filtered by the authors to only include firms with at least 20 percent annualized growth over three years and \$2 million dollars in annual revenue by the third year of growth. Applying a consistent growth threshold to the list allows us to track trends in the population of Inc. 500|5000 companies over time. These firms come from a wide range of industries, from high-tech to everyday retailers. Examples of companies on the Inc. 500|5000 list have included “stereotypical” high-growth tech firms, such as Facebook, Microsoft, Oracle, Go Pro, and Zappos, as well as firms in less “top-of-mind” industries, such as Domino’s Pizza, Planet Fitness, and Jamba Juice (Motoyama and Danley 2012).

For calculating the High-Growth Company Density, we started with the 5000-company list of high-growing private companies curated by *Inc.* magazine based on the applications received through its selection process. We cut the list down to include only firms with at least 20 percent annualized growth over a three-year period—which compounds to 72.8 percent after the three years—and at least \$2 million dollars in annual revenue. This growth cutoff is based on the recommended levels put forward by the OECD’s Entrepreneurship Indicators project. After imposing this growth threshold—which excludes usually between 20 and 40 percent of the 5,000 firms on the Inc. list in a given year—we are able to look at how the number of U.S. high-growth firms fluctuates over time and by geography. The last step in the creation of the High-Growth Company Density measure is to normalize the number of companies from the narrowed-down Inc. 5000 list by the population of total employer firms in a given geography as measured by the U.S. Census Bureau’s Business Dynamics Statistics (BDS). While the Inc. list goes up to 2015, the latest data available on the BDS goes up to 2013. As such, we normalize Inc. numbers from 2015 and 2014 against the total firm population from BDS for 2013.

The High-Growth Company Density has no upper-bound restriction on firm age, though it does require firms to be at least three years-old. As such, the age of high-growth firms spans a wide range, although these firms skew young. A plurality of high-growth companies (31.5 percent) are aged between five and seven years old, and 59.1 percent are ten years old and younger.

This measure is based on previous research by the Kauffman Foundation examining the geography of Inc. 500 companies’ over time (Motoyama and Danley 2012). It also is based on the entrepreneurship fluidity measure suggested by our Kauffman Foundation colleagues Stangler and Bell-Masterson (2015).

The Inc. 500|5000 lists have biases introduced as the result of any undocumented changing criteria for judging over time and also the fact that businesses must seek out the designation. While Inc. firms arguably are not representative of all U.S. high-growth companies by revenue, the dataset is one of the few that allows us historically and reliably to track trends of revenue-focused high-growth in the country at the national, state, and metro levels. Moreover, the Inc. 500|5000 lists have been utilized in entrepreneurship research for decades (Bhide 2000).

Matching BDS state and national numbers to Inc. data is a non-issue because the definitions of the geographical areas are the same. However, this is slightly different for metropolitan areas. Because metropolitan-area definitions may vary across datasets, we used the Office of Management and Budget (OMB) definitions for metropolitan areas from December 2009 to calculate High-Growth Company Density. This is the definition of metros used on the BDS dataset, and it means that, to calculate the number of high-growth companies using the Inc. 500|5000 data, we aggregated population data from the ZIP and street level up to the metropolitan level.

The Inc. 500|5000 data has state, ZIP, and street level address information on the companies, and we used that data to match high-growth companies to metros. This is a multi-step process. First, we created a crosswalk file connecting ZIP codes to counties, which makes it possible to then match ZIP codes to metros according to the Office of Management and Budget (OMB) 2009 definitions. To create the ZIP to county crosswalk, we started with the Department of Housing (HUD) ZIP-to-County file.⁸ When a ZIP code crossed county boundaries, we matched it to the county with the highest ratio of addresses for that ZIP

8. HUD USPS ZIP Code Crosswalk Files https://www.huduser.gov/portal/datasets/usps_crosswalk.html.

code. In the case when there was a tie, we used the ratio of business addresses, residential addresses, and other addresses, in that order, to untie. When there was still a tie (only five ZIP codes in the country), we picked one county for a match. The HUD crosswalk is extensive but not comprehensive, so we complemented it by merging it with the with University of Missouri ZIP-to-County data geocoder for ZIPs not included in the HUD file.⁹ Similarly, when a ZIP code crossed county boundaries, we matched it to the county with the highest population for that ZIP code in 2010. Second, we matched Inc. 500|5000 entries that contained ZIP code location to the ZIP-to-County combined crosswalk file we created. Most of the companies in the data (approximately 94.4 percent of the 45,000 companies in the dataset) had ZIP location information that matched to a county. Third, for the approximately 2,500 unmatched companies, we did two rounds of geocoding using the HERE API to identify ZIP codes for these firms. The first round used the structured street level address and state for matching. Almost all 2,500 businesses were matched in that way, with only forty-nine businesses remaining unmatched. The second round of geocoding with the HERE API did a free text search on the location data available of these companies, and identified the location of thirty-two of the forty-nine.¹⁰ Fourth, for the remaining seventeen companies, we manually searched for their ZIP codes on their websites and through internet searches.

Advantages over Other Possible Measures of Entrepreneurship

The Kauffman Index of Growth Entrepreneurship has several advantages over other possible measures of growth entrepreneurship activity based on household or business-level data. We chose to use two main distinct datasets: one based on all employer businesses (BDS) and the other based on the fastest-growing private companies in America (Inc. 500|5000 lists). This allows us to study private growth companies in their earliest years, when only the government is likely to be aware of them, and also at later stages. Importantly, the goal of this report is to focus on “outputs” of growth entrepreneurship (e.g., change

in employment size, revenue growth) instead “inputs” (e.g., investment, patents)—thus capturing realized rather than predicted or expected growth. These datasets have complementary strengths that make this Index a robust measure of growth entrepreneurship.

There are other available strong measures of growth and growth potential for startups that were not referenced here because of certain tradeoffs. Guzman and Stern (2016), for instance, while very helpful, has indicators that are not yet available for the geographical coverage we were looking for here (i.e., all states and the country’s forty largest metros).

Rate of Startup Growth and Share of Scaleups

The first two components of the Growth Index—Rate of Startup Growth and Share of Scaleups—both use the U.S. Census Bureau’s Business Dynamics Statistics, which presents several benchmarking advantages. First, the BDS is based on administrative data covering the overall employer business population. As such, it has no potential sampling issues. Second, it has detailed coverage across all levels of geography, including metropolitan areas. Third, it provides firm-level data, rather than just establishment-level data. Fourth, it provides detailed employment level and age breakdown of firms, allowing us to clearly identify firms by age and size.

Similar to the BDS data is the Business Employment Dynamics (BED) dataset from the Bureau of Labor Statistics. We chose not to use it for this report because of two distinct advantages we see the BDS having over the BED. First, the BDS tracks firm-level data, as opposed to the establishment-level data tracked by the BED. Second, BED does not have metropolitan-level data available, while BDS data are available at our three geographic levels. Because the BED tracks establishments rather than firms, the BDS numbers are different than the BED numbers. Nonetheless, the trends on the two datasets move largely in tandem and usually point in the same direction.

High-Growth Company Density

The last measure in the Growth Index—the High-Growth Company Density—is based off of one of the oldest, continuous rankings of growth companies in the United States—the Inc. 500|5000 lists.

9. University of Missouri Census Data Center. MABLE/Geocorr12: Geographic Correspondence Engine. <http://mcdc.missouri.edu/websas/geocorr12.html>. Accessed in April 13, 2016.

10. For full documentation on the differences in free text versus structured geocoding on the HERE API, please see full documentation of HERE Geocoder API <https://developer.here.com/rest-apis/documentation/geocoder/topics/overview.html>.

While the U.S. government has produced a time series documenting growth companies at the national level through the Organisation for Economic Cooperation and Development's Entrepreneurship Indicator Project, this time series is relatively short, covering only a few years, and currently not available at the subnational level. As such, we needed to look for an alternative source of data. Some potential alternatives, such as the National Establishment Time-series dataset or other Dun & Bradstreet-based alternatives, potentially could have been utilized but are not as timely as the Inc. list and also are not publicly available. The Inc. 500|5000 lists have biases introduced as the result of any undocumented changing criteria for judging over time and also the fact that businesses must seek out the designation. While Inc. firms arguably are not representative of all U.S. high-growth companies by revenue, the dataset is one of the few that allows us historically and reliably to track trends of revenue-focused high-growth in the country at the national, state, and metro levels. Despite its limitations, the Inc. 500|5000 lists have been utilized in entrepreneurship research for decades because of their strengths compared to the alternatives (Bhide 2000).

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NOTES



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