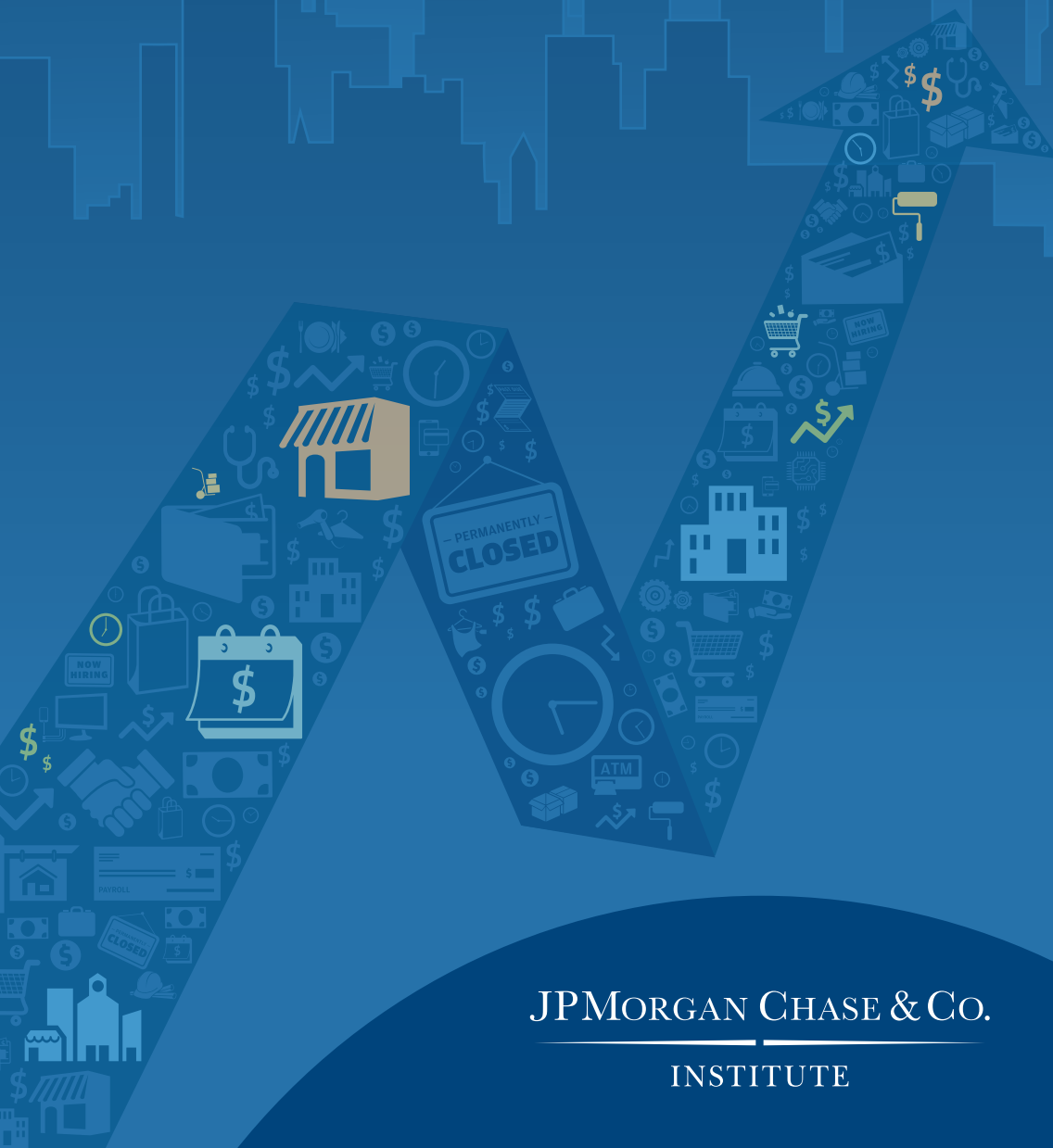


May 2019

The Small Business Sector in Urban America

Growth and Vitality in 25 Cities



JPMORGAN CHASE & Co.

INSTITUTE

About the Institute

The global economy has never been more complex, more interconnected, or faster moving. Yet economists, businesses, nonprofit leaders, and policymakers have lacked access to real-time data and the analytic tools to provide a comprehensive perspective. The results—made painfully clear by the Global Financial Crisis and its aftermath—have been unrealized potential, inequitable growth, and preventable market failures.

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The JPMorgan Chase Institute is a global think tank dedicated to delivering data-rich analyses and expert insights for the public good.

Acknowledgments

This research would not have been possible without the creativity, analytic effort, and insight of Carlos Grandet-Caballero and the critical supportive feedback of Chi Mac. We thank them both for their hard work and contributions to this research.

We are also grateful for the invaluable constructive feedback we received from academic and industry policy experts, including August Benzow, Kenan Fikri, Tom Sullivan, Holly Wade, Howard Wial, Anita Yadavalli, and Kim Zeuli. We are deeply grateful for their generosity of time, insight, and support.

This effort would not have been possible without the diligent and ongoing support of our partners from the JPMorgan Chase Consumer and Community Bank and Corporate Technology teams of data experts, including, but not limited to, Howard Allen, Connie Chen, Anoop Deshpande, Andrew Goldberg, Senthilkumar Gurusamy, Derek Jean-Baptiste, Joshua Lockhart, Ram Mohanraj, Stella Ng, Subhankar Sarkar, and Melissa Goldman. The project, which encompasses far more than the report itself, also received indispensable support for our Internal partners in the JPMorgan Chase Institute team, including Elizabeth Ellis, Alyssa Flaschner, Fiona Greig, Courtney Hacker, Sarah Kuehl, Caitlin Legacki, Melissa O'Brien, Sruthi Rao, Carla Ricks, Tremayne Smith, Tany Sonthalia, Gena Stern, Maggie Tarasovitch, Preeti Vaidya, and Marvin Ward.

Finally we would like to acknowledge Jamie Dimon, CEO of JPMorgan Chase & Co., for his vision and leadership in establishing the Institute and enabling the ongoing research agenda. Along with support from across the firm—notably from Peter Scher, Max Neukirchen, Joyce Chang, Patrik Ringstroem, Lori Beer, and Judy Miller—the Institute has had the resources and support to pioneer a new approach to contribute to global economic analysis and insight.

Contact

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Executive Summary

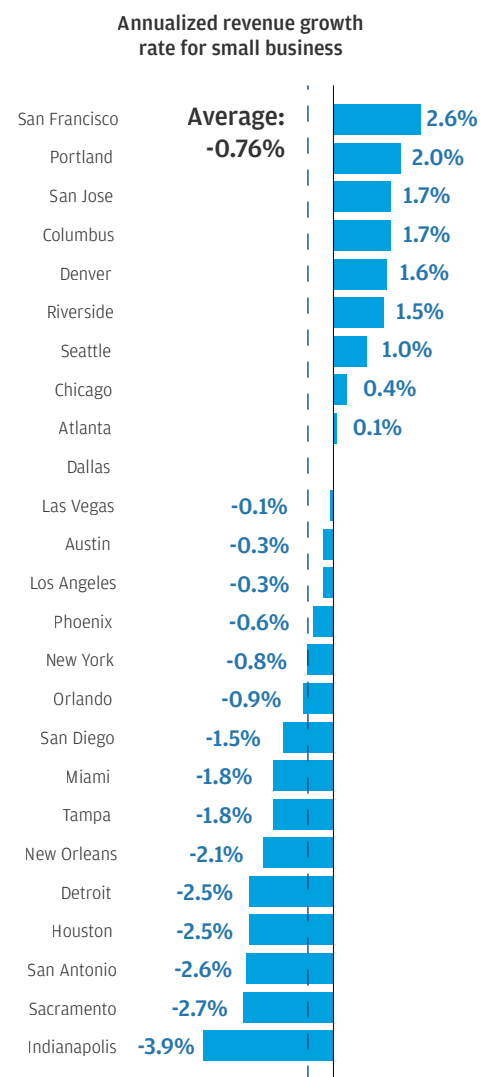
Small businesses are one of the pillars of urban economies, making substantial contributions to economic growth and dynamism. However, the fragility of the small business sector is an ongoing challenge that limits how much it contributes to economic growth in cities. Nine out of ten cities in the United States are losing businesses faster than they are creating them (Economic Innovation Group, 2017). Understanding the drivers of growth and failure in the small business sector—and the variation of these drivers across cities—is critical to the development of policies that promote small business survival and growth.

This report aims to inform differences in financial outcomes in the small business sector across some of the largest cities in the US, providing a lens into the composition and contributions of different types of firms to the aggregate revenue growth and exit rates of the small business sector.

Our findings are four-fold:

1. New firms account for most of the revenue growth in the small business sector, but their contributions to growth vary widely by city
2. Among new small businesses, five percent of firms account for nearly all aggregate revenue growth across cities, and these usually grow organically
3. While revenue growth rates vary substantially by industry across cities, small firms in construction, other professional services, health care services and high-tech services drive aggregate growth in most cities
4. Across cities, retail and other professional services drive small business exits

These findings suggest that both local and national policymakers interested in the financial health of the small business sector might benefit from paying closer attention to themes that are similar across cities, and important differences between cities. Across cities, a relatively small share of businesses drove aggregate revenue growth, but most of these firms grew without substantial reliance on external finance, and most of these firms were outside of industries typically thought of as high-growth. Moreover, while some cities maintained uniquely low small business exit rates given their revenue growth, these differences were driven more by within-industry differences in exit rates than by industry composition.



Source: JPMorgan Chase Institute

Introduction

From the local family-owned and operated dry cleaner next to the train station to the innovative venture-funded biotech start-up in a technology park, small businesses play an important role in city economies. In the US, 80 percent of all businesses have no employees at all, and of those with employees, over 99 percent have fewer than 500.¹ Moreover, the financial and economic health of the small business sector can play a significant role in shaping the financial and economic health of local communities. Places with larger shares of small businesses have stronger per capita income growth, faster employment growth, and lower poverty rates (Rupasingha, 2013). Beyond these economic impacts, small businesses can help create a sense of community in a city and contribute to the distinctive vibrancy of neighborhoods (Jacobs, 1961). Yet, many small businesses face financial challenges that can limit their ability to survive and thrive. Most small businesses experience volatile and irregular cash flows (Farrell et al., 2018b) which can be especially difficult to manage given the substantial liquidity constraints most small businesses face (Farrell and Wheat, 2016). These challenges warrant close attention to the sector and its contribution to the economic health of cities.

Local policymakers may have the most direct interest in understanding the financial health of the small business sector at the city level. Many local policies and institutions aim to create a supportive environment for small businesses, particularly given their relative fragility and the challenges faced by the sector as a whole. These policies and institutions include but are not limited to access to capital programs, regulatory reform, and training and assistance for small business owners and prospective entrepreneurs. While such programs are likely to support the health of the small business sector, empirical data on its financial performance specifically at the city level is limited.² As a result, it may be difficult for local policymakers to evaluate the performance of these programs with respect to small business financial health, or target their efforts to the businesses that need them the most.

These local interests notwithstanding, city-level differences in the financial health of the small business sector have implications for the national economy as well. The experiences of small business in cities as different as San Francisco, Detroit, Columbus, or New York City are ever more important given the widening gap in economic outcomes across geographies in the United States—both broadly speaking (Drennan, 2005; Ganong and Shoag, 2017), and particularly in the small business sector (Berry and Glaeser, 2005). New data on city level differences in small business financial outcomes can help inform this broader

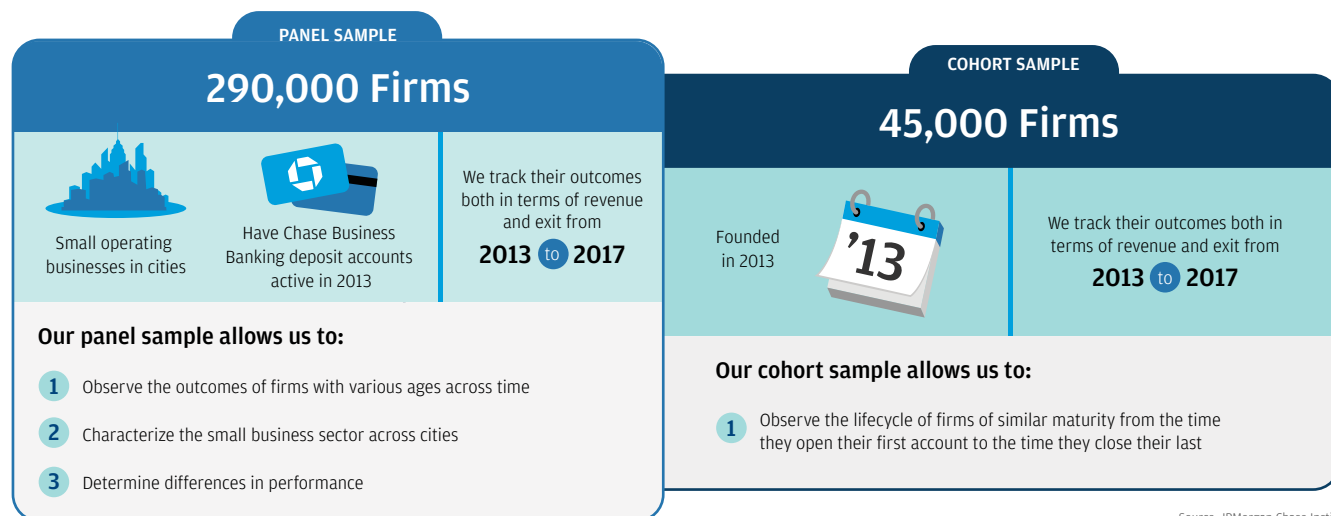
set of concerns about the implications of regional divergences in economic opportunities.³

With these concerns in mind, this report aims to inform differences in financial outcomes in the small business sector between some of the largest cities in the US. In doing so, it provides a lens into the contributions of different types of firms to the aggregate revenue growth of the small business sector. We aim to both enable an evidence-based approach to small business policy at the local level, and to contribute to the wider understanding of the drivers behind the growth and vitality of small business in urban America. To this end, we leverage our unique longitudinal view of 290,000 firms using their financial transactions from 2013 to 2017 to analyze the performance of small business across 25 US cities. We also focus on a cohort of 45,000 firms founded in 2013 that provides a longitudinal window to small business performance in the crucial early stages of their lifecycle. We use these data to analyze aggregate revenue growth and exit rates in the small business sector of each city.

Through these lenses, our findings reveal both consistent patterns of small business financial performance across many cities, as well as cities in which the small business sector diverges from the most common pattern. Overall, we observe that in most cities, the set of small businesses operating in 2013 produced less aggregate revenue in 2017 than in 2013, though over this time period, the sector produced gains in a handful of cities, mostly on the West Coast. We then turned to understanding some of the drivers of this growth, and found three general patterns. First, aggregate revenue gains are generally concentrated in new firms. While a few cities had substantial shares of growth from firms that were less than ten years old in 2013, in the majority of cities, revenue growth was generated by firms founded in 2013. Second, among these new firms, aggregate revenue growth was driven by a small minority of firms. Across cities, revenue gains were concentrated in less than five percent of new small businesses. Notably, aggregate revenue growth among these five percent of firms largely was driven by firms that grew organically rather than through external finance. However, in a few cities, these financed growth small businesses made substantial contributions to revenue growth. Third, in the majority of cities, aggregate revenue growth contributions were driven by small businesses in the construction, other professional services and health care services industries. Finally, small business exits, while showing some differences across cities, were largely driven by the retail and other professional services industries.

Data Asset

Our panel sample consists of 290,000 small operating businesses in cities. These firms have Chase Business Banking deposit accounts that were active in 2013. We track their outcomes both in terms of revenue and exit (see Glossary for definition) from 2013 to 2017. Our panel sample allows us to observe the outcomes of firms with various ages across time in order to characterize the small business sector across cities and determine differences in performance. We also identified a cohort sample of 45,000 firms founded in 2013, and track their outcomes over the same period of time. This cohort sample allows us to observe the lifecycle of firms of similar maturity from the time they open their first account to the time they close their last.



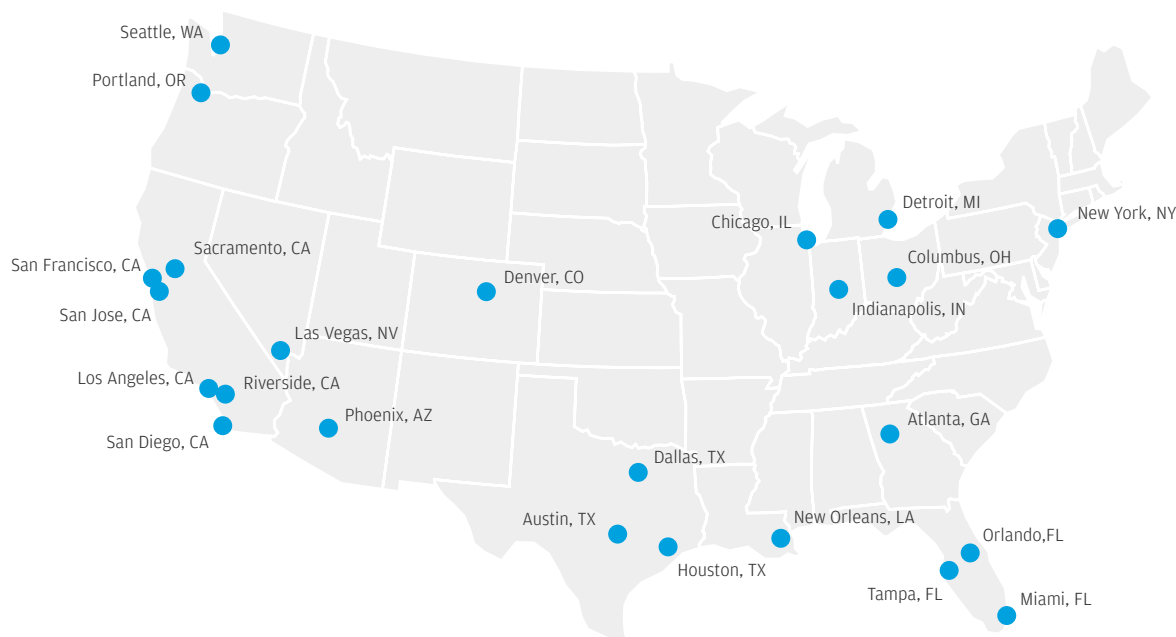
Source: JPMorgan Chase Institute

Our sample is based on business deposit accounts and not on employment records,⁴ which allows our data to provide insights on the vast majority of small businesses that do not have paid employees. In fact our data shows that most small businesses are nonemployers, and most of them will not transition to employer status during their lifetime (See Appendix). As we have shown in previous reports, 2.5 percent of nonemployers become employers in their first year of operations and the rate of transition to employment declines as they mature (Farrell et al., 2018b). While most firms in our sample are nonemployers, they are nevertheless sufficiently formal to have business banking accounts. We do not capture informal businesses that operate only through cash or personal deposit accounts. The appendix provides additional details about the process used to construct these samples.

Finally, our selection of cities is based on a prior report that characterized the growth and vitality of the overall small business sector (Farrell et al., 2018b). That report selected the top 25 metropolitan areas with the highest number of firms in our sample to provide a geographical lens to our analysis. Since our sample is restricted to places where Chase has branches in operation, some large metropolitan areas are absent from our sample. One of the motivations behind this report was to build from this prior report and further explore the trends in growth and vitality of the small business sector in “central cities.” We define a central city as the most populous city in a metropolitan area.

Our focus on central cities aims to address the issue of multiple jurisdictions that may be responsible for outcomes within metropolitan areas. For example, the Los Angeles metropolitan area encompasses approximately 60 different cities. Central cities have clearer administrative boundaries, usually with only one administrative body at the local level responsible for policy and regulation, which allows an easier comparison of economic outcomes and better understanding of the policies impacting the small business sector.

Figure 1: Central cities in the sample



Source: JPMorgan Chase Institute

Overview: The Small Business Sector in US Cities

While many local policies are directed at the small business sector, surprisingly little empirical data documents the financial health of the sector at the city level, especially the approximately 80 percent of small businesses that have no employees.

We provide an initial context for city-level small business sector financial performance by documenting aggregate revenue growth for a panel of small businesses from 2013 to 2017. Specifically, for each city, we compute aggregate annual revenue growth—a comparison of the aggregate annual revenue of all small businesses that were in our sample in 2013 to the aggregate annual revenue for that same sample of firms in 2017. This aggregate lens provides a useful view of the financial health of the small business sector in a city by summarizing across firms with growing revenues, those with declining revenues, and those who exit and experience full revenue loss. Figure 2 presents this aggregate revenue growth rate for each of 25 large US cities.

The financial performance of small businesses as a whole varied substantially across cities. The aggregate revenue of small businesses operating in cities like San Francisco and Portland in 2013 grew 2 percent or more annually over a period of four years, while the small business sector in places like Houston and Sacramento experienced revenue declines of 2.5 percent or more per year over this same period. Indianapolis experienced a decline of 3.9 percent. Notably, the majority of the 25 cities we analyzed experienced negative aggregate revenue growth from 2013 to 2017—the sector grew in only nine cities, but decreased in 16.

Moreover, the differences we observe in aggregate revenue growth may be specific to the cities in which these small businesses operate, rather than being tightly coupled to the economic outcomes of the broader regions in which these cities are embedded. Figure 3 compares aggregate revenue growth in each of these 25 cities to the aggregate revenue growth we observe for the metropolitan area in which the city is located. In most cities, small business aggregate revenue grew faster in the metro area than it did in the central city. However, in Chicago, Riverside, Columbus, and San Francisco, aggregate small business revenue grew faster in the central city than it did in the metropolitan area as a whole.

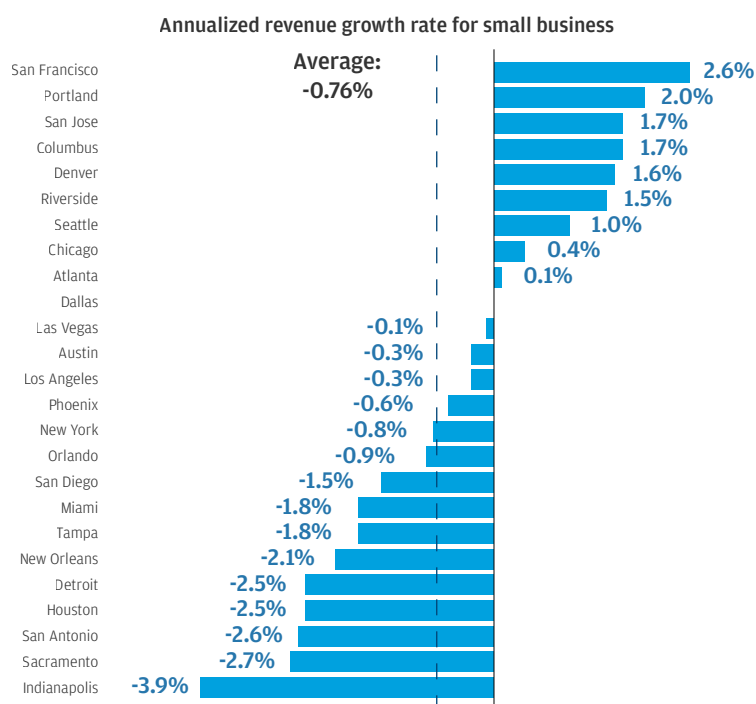
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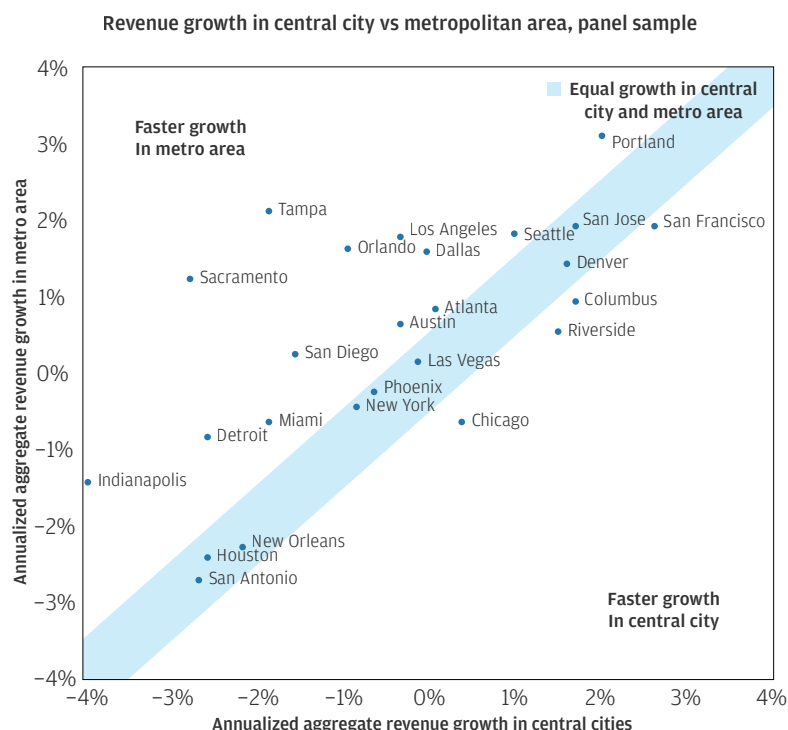
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Figure 2: Aggregate small business revenue growth varies widely across cities



Note: Aggregate revenue growth reflects annualized growth rate from 2013 to 2017.
Source: JPMorgan Chase Institute

Figure 3. Revenue growth in the central city can differ substantially from revenue growth in the metro area



Note: Aggregate revenue growth reflects annualized growth rate from 2013 to 2017.
Source: JPMorgan Chase Institute

Findings

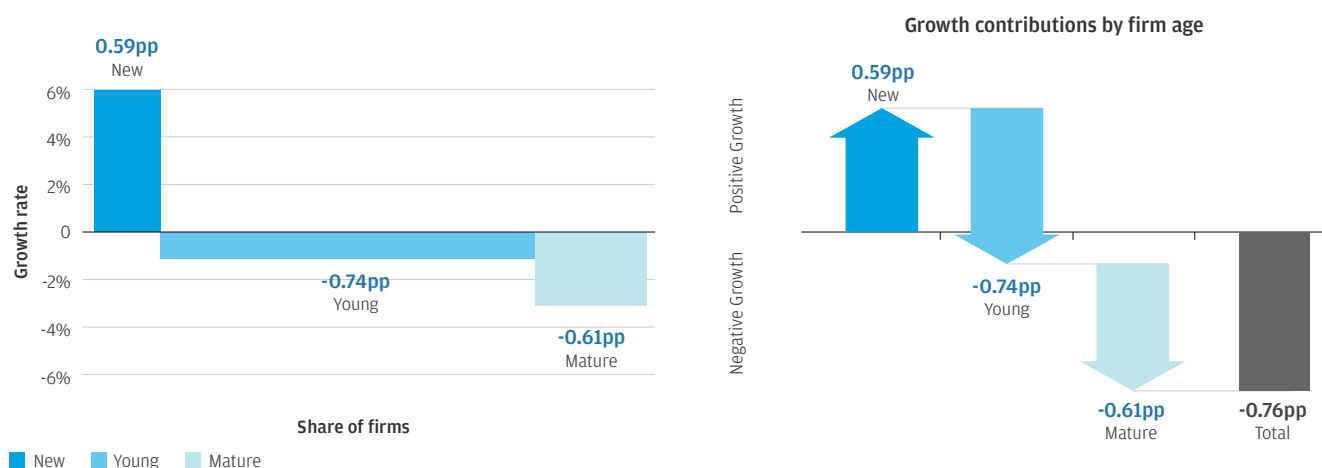
Finding One

New firms account for most of the revenue growth in the small business sector, but their contributions to growth vary widely by city

Firm age is a key dimension that differentiates small businesses (Farrell and Wheat, 2017). Key performance indicators such as revenue growth and exit rates vary by firm age. The overall high exit rate among small businesses in particular limits the contributions of the sector to overall economic growth. However, among younger firms, growth rates in the sector more than compensate for the exit rates of new firms. Four years after beginning operations, newly founded small businesses generate an aggregate revenue increase of 20 percent (Farrell et al., 2018b). Moreover, new businesses create nearly all net new jobs (Haltiwanger et al., 2017), while firms over five years old destroyed more jobs than they created in all but eight of the years between 1988 and 2012 (Wiens and Jackson, 2015).

To understand the impact of firm age on revenue growth, we explore contributions to aggregate revenue growth in our panel sample for new firms less than a year old, for young firms aged one to 10, and for mature firms over 10 years old. Figure 4 shows growth contributions—the extent to which each age segment added (or subtracted) from aggregate revenue growth in the sector. The left panel of Figure 4 decomposes growth contributions by illustrating both the growth rate and the relative size of each segment, based on their revenue shares. In aggregate, new firms experienced 6 percent annual revenue growth, and generated 12 percent of total revenues, adding 0.59 percentage points (pp) to aggregate growth. Young firms experienced a 1.09 percent decrease in revenues per year, and generated 68 percent of revenues, subtracting 0.74 percentage points from growth. While mature firms generated 20 percent of revenues, their aggregate revenue decreased by 3 percent, leading to a subtraction of 0.61 percentage points from aggregate growth. In our sample, we saw overall revenue losses of 0.76 percent per year, and new firms were the only positive contributors. The right panel of Figure 4 shows overall growth contributions by each age segment. All positive contributions to aggregate revenue growth came from new firms, while young and mature subtracted from growth, with a larger subtraction from the young firms segment due to its large revenue share relative to the other two age segments.

Figure 4. New small businesses drive all aggregate revenue growth

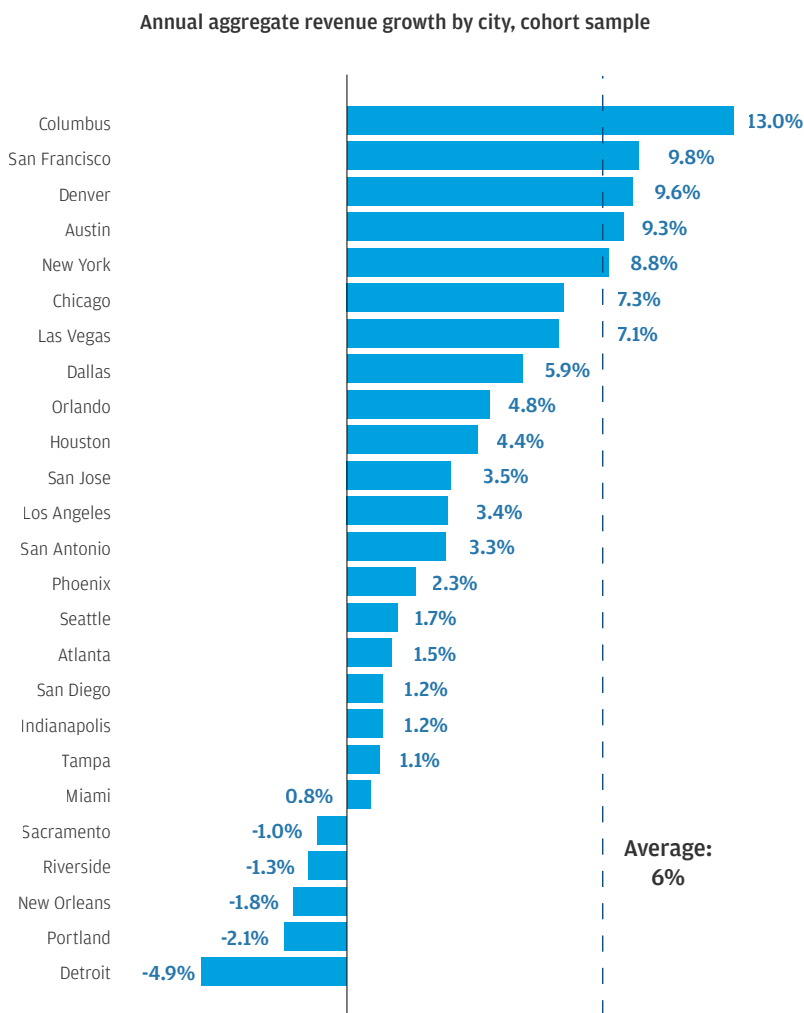


This result illustrates the challenges the sector faces in maintaining growth with contributions from firms only in the early years when they are small and growing fast. The combination of decreased growth rates in older firms and high exit rates stops the small business sector from generating higher aggregate revenue. This new evidence emphasizes the importance of creating policies that help small businesses survive and keep growing beyond their initial years, as well as maintaining an environment that supports the creation of new business, as new firms tend to drive growth in the sector. This is ever more important given the well-documented decline in dynamism and small business creation in the United States (Hathaway and Litan, 2014; Economic Innovation Group, 2017).

Given the large contributions of new firms to revenue growth, we examined aggregate growth for our cohort sample which consists of firms founded in 2013. Specifically, we observe these new firms in their critical first four years of operations and determine which cities had higher aggregate revenue growth. Figure 5 shows the aggregate annual revenue growth of these new firms in each of the 25 cities in our sample.

We saw that aggregate revenue growth varied especially sharply across cities among the new firms that constitute our cohort sample. Figure 5 shows that there are seven cities that are growing faster than the average: Columbus, San Francisco, Denver, Austin, New York, Chicago, and Las Vegas. The case of Columbus is particularly striking: new small businesses are growing at a rate of 13 percent annually. In contrast, there are cities where new small businesses experience negative aggregate revenue growth: Sacramento, New Orleans, Riverside, Portland, and Detroit. The rest of the cities experience aggregate revenue growth among new small businesses ranging from 0.9 to 5.8 percent. The cities where small businesses are growing the fastest are a mix of big cities with established thriving economies such as San Francisco and New York, and smaller economically emerging cities such as Denver and Austin.

Figure 5. Aggregate revenue growth of new firms varies substantially across cities

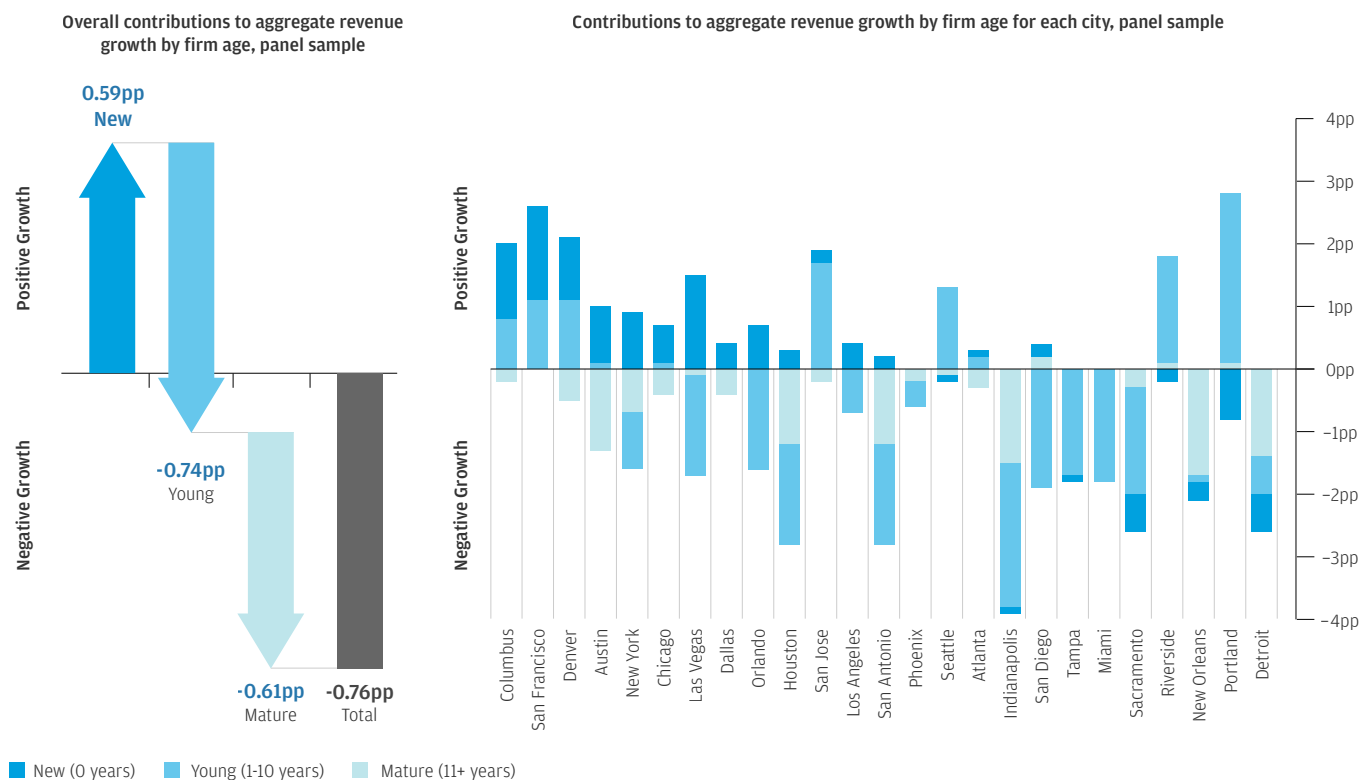


Note: Aggregate revenue growth reflects annualized growth rate from 2013 to 2017. Source: JPMorgan Chase Institute

The annual aggregate revenue growth in each city was different between new small businesses and small businesses of all ages. In most cities, new small businesses grew faster than the sector overall, often substantially so. For example, in San Francisco, revenue of new small businesses grew at a rate of 9.8 percent while businesses of all ages saw revenue growth of 2.6 percent. This is consistent with prior research that illustrates the importance of new business for local economies (Davis et al., 2017).

In contrast to our result across all cities, new firms were not the only drivers of growth in every city. Figure 6 presents the results of this growth decomposition by age for each of the 25 cities we analyze, ordered based on their new firm aggregate revenue growth rate. Growth contributions by age segment vary substantially across cities. For instance, in the cities where the small business sector is growing the fastest, such as Columbus, San Francisco, and Denver, both new and young firms made positive contributions to aggregate revenue growth. However, in most cities both young and mature firms made small positive or large negative contributions to growth. In fact, the small business sectors in Orlando, San Antonio, and San Diego that experienced negative growth, did so because their new firms were not growing fast enough to compensate for the aggregate declines in revenue generated by young and mature business. Moreover, new firms made positive contributions to growth in all but five cities: Sacramento, New Orleans, Riverside, Portland, and Detroit. Out of these cities, in Detroit, Sacramento, and New Orleans small businesses of all ages made negative contributions to aggregate revenue growth. Notably, in Riverside and Portland, while aggregate revenues were declining overall, young firms made positive contributions to aggregate revenue growth.

Figure 6. New firms account for the majority of aggregate revenue growth in most cities



Note: Aggregate revenue growth reflects annualized growth rate from 2013 to 2017.

Source: JPMorgan Chase Institute

Finding Two

Across cities, five percent of firms account for nearly all aggregate revenue growth among new small businesses, and these usually grow organically

The previous finding established that in most cities, new firms were largely responsible for aggregate revenue growth in the small business sector. However, existing research provides little evidence as to the concentration of this growth in a few firms. With a focus on employment as an outcome measure, some researchers and policymakers have drawn attention to the outsized contributions of a very small number of high-growth firms (Birch and Medoff, 1994), particularly those that significantly leverage external finance in capital markets. Others have drawn attention to the broad-based contributions of firms that individually grow more slowly but drive substantial economic growth in aggregate (Farrell et al., 2018b), or have recognized that high-growth young firms make disproportionate contributions to output and productivity growth (Haltiwanger et al., 2017).

We first pursue this question by sorting individual new firms in our cohort sample by their total dollar value change in revenue from 2013 to 2017 to identify the firms that contribute the most to aggregate revenue growth. We classify these firms into four growth tiers: a top tier of firms in the top 5 percent by dollar value change in revenue among surviving firms, a second tier of the next highest 5 percent, a third tier of all other surviving firms, and a fourth tier of firms that exited. Figure 7 shows that firms in the top 5 percent growth tier had a median annual revenue of around \$300,000 in 2013 (year 1 of panel) and 1.6 million in 2017 (year 4 of panel), representing a growth rate of 380 percent. The median revenue in the next highest 5 percent was 220 percent higher in 2017 than it was in 2013—a large change though smaller than the change among the top 5 percent of firms. In contrast, the median revenue level among firms in the bottom 90 percent grew by only 11 percent.

Figure 7. Firms in top five percent aggregate growth tier are large but experience high growth rates

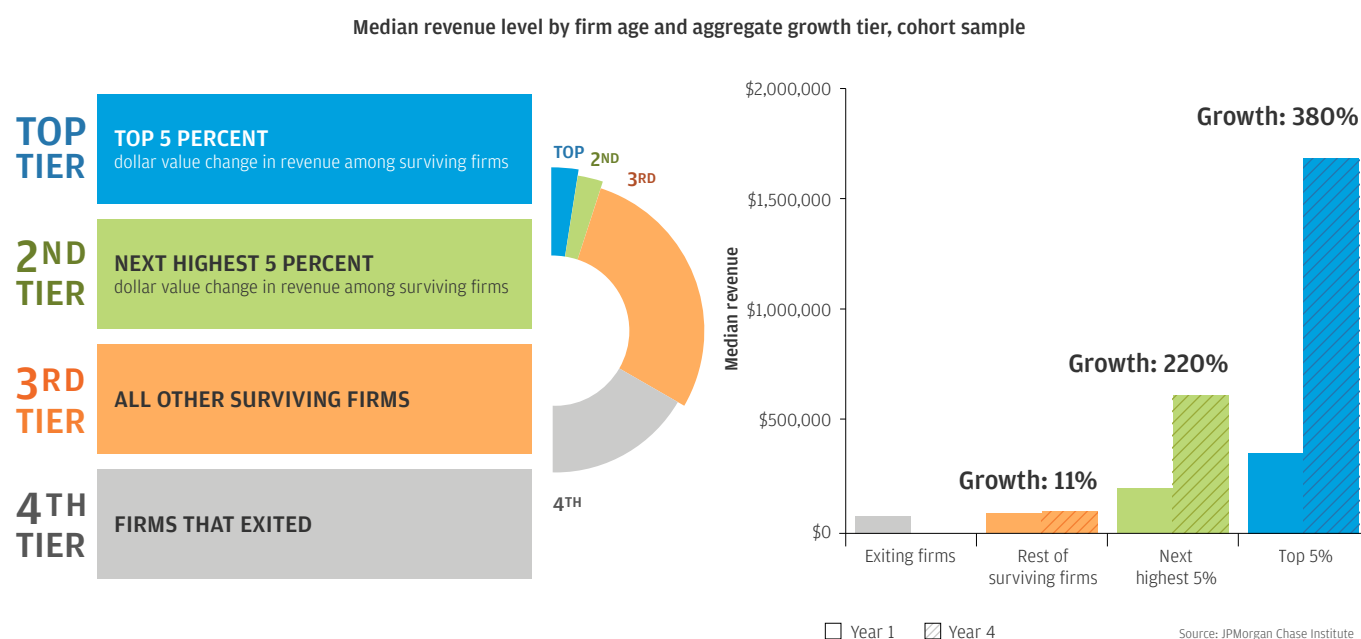
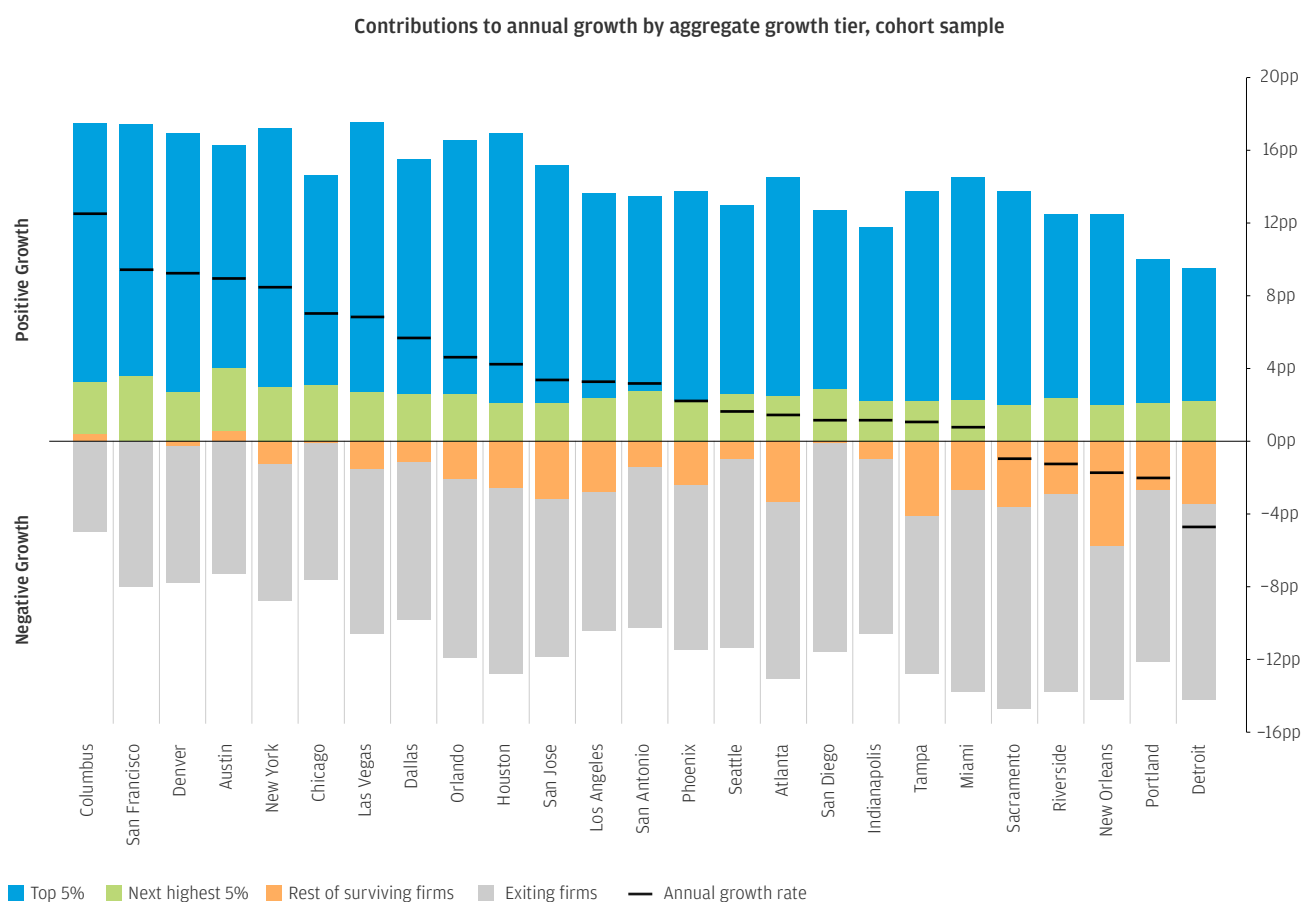


Figure 8 shows the contributions to aggregate revenue growth by each of these growth tiers. Across cities, the top 5 percent of new firms make the overwhelming majority of positive contributions to aggregate revenue growth. New firms in the top 5 to 10 percent make a significantly smaller contribution to growth, and collectively, the firms that are in the bottom 90 percent subtract from growth in all but a few cities. While exiting firms subtract from aggregate revenue growth by definition, the extent to which these subtractions are larger in cities with small or negative overall growth rates is notable. The small contributions of the 90 percent of slowest growing non-exiting firms that constitute the preponderance of firms in the sector further illustrate the difficulties many small businesses face in generating financial growth. Even cities with a high overall revenue growth rate such as Columbus or San Francisco depend mostly on the top 5 percent of firms to grow large enough to generate value for the local economy.

Figure 8. Contributions to annual growth by type of firm, cohort sample



Note: Aggregate revenue growth reflects annualized growth rate from 2013 to 2017.

Source: JPMorgan Chase Institute

In some cities, new small businesses grew faster than those in other cities not only because of larger contributions from the top 5 percent but also because there was less of a drag from firms outside the top 10 percent. For example, in cities where new firms show the highest overall aggregate revenue growth, surviving firms outside of the top 10 percent made positive contributions, while these firms subtracted from growth in most cities. By a similar logic, the vitality of new small firms across cities also plays a substantial role in shaping local growth dynamics. New small firms generally have high exit rates—across regions, 30 percent of new firms fail to survive for at least four years (Farrell et al., 2018b). Figure 8 shows not only that the revenue forgone by these exiting firms had a large impact on the ability of the sector to grow, but that the drag from exits was most pronounced in cities where new firms saw the lowest aggregate revenue growth rates.

If new firms drive most of revenue growth in the small business sector, and only five percent of new firms are responsible for that growth, what are the characteristics of this five percent of new small businesses? To address this question, we assess the distribution of these firms across a segmentation of the small business sector that classifies firms on the basis of their size and dynamism (see Box 1 for details of the segmentation—further details available in Farrell et al., 2018b). In particular, this segmentation identifies a small but important segment of potentially high-growth firms that grow through the use of external finance, and a much larger and more broad-based segment of firms that grow organically without substantial reliance on external finance. Across the full cohort of small businesses founded in 2013, these organic growth firms generated the majority of revenue in aggregate, though financed growth firms generated more revenue on a per-firm basis.

Box 1: A segmentation of the small business sector

We previously developed a segmentation of the small business sector based on distinctions in employer status, growth potential, and financing utilization among firms in their first few years of operation (Farrell et al., 2018b). Specifically, we treated growth potential and employment status as first-order distinctions, but widened our lens on growth potential to identify not only a small segment of financed growth firms that leverage external capital to grow, but also a much larger segment of organic growth firms that may achieve similar growth rates without depending on external financing at all or to as large of an extent. Our previous report included details and fictional examples that illustrate the four mutually exclusive segments, but we summarize their characteristics here.



Source: JPMorgan Chase Institute

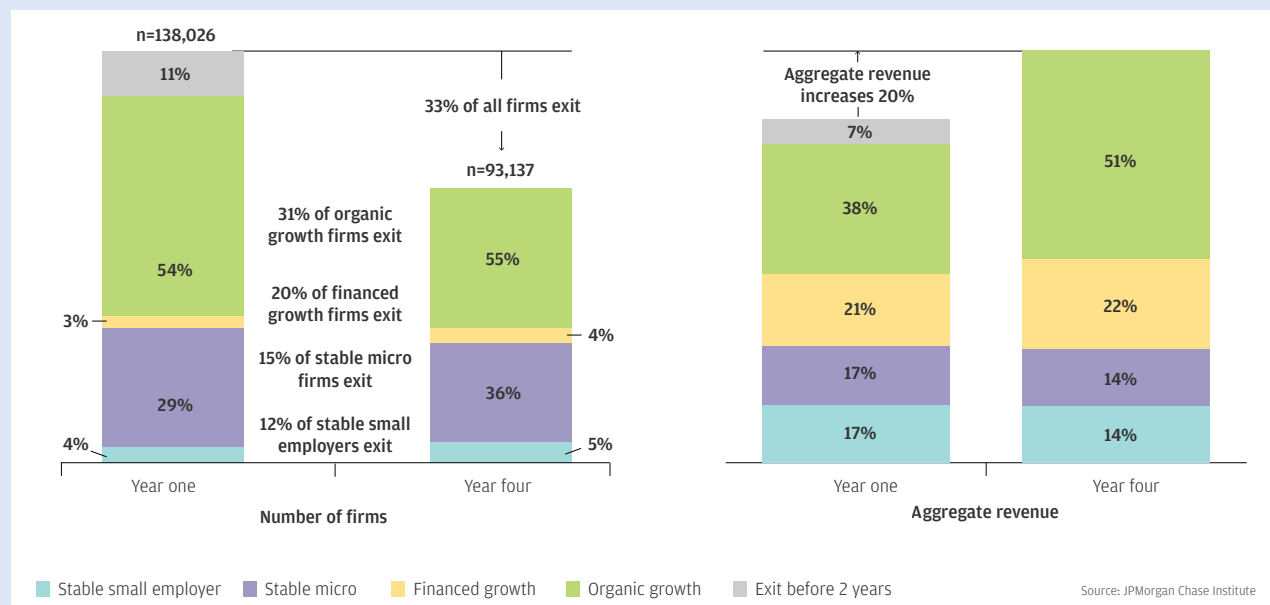
- **Financed growth**—These firms engage in financial behaviors consistent with the intention to make early investments in assets that would serve as the basis for a scale-based competitive advantage (e.g., investments in technology, brand, learning curve, or customer networks). Specifically, we identify a firm as a member of the financed growth segment if it has at least \$400,000 in financing cash inflows during its first year—a level consistent with financing amounts used by small businesses that take in investment capital.⁵
- **Organic growth**—Firms in this segment also have growth intentions, but they primarily attain that growth organically out of operating profits rather than through the use of external financing. In order to capture both firms that intend

to grow and succeed and those that intend to grow but fail, we leverage post hoc observations of revenue growth and define this segment as those firms with less than \$400,000 in financing cash inflows in their first year that either achieve average revenue growth of at least 20 percent per year from their first year to their fourth year, or those that see revenue declines of at least 20 percent per year. We also include firms that exit prior to four years that average above 20 percent revenue growth or 20 percent revenue declines per year prior to exit.

- **Stable small employer**—Firms in this segment are less dynamic: they are in neither the financed growth nor the organic growth segments and likely have a stable growth strategy and a business model premised on the employment of others. We define stable small employers as those firms that have electronic payroll outflows in six months or more of their first year. To capture larger small employers who do not use electronic payroll, we also include firms that have over \$500,000 in expenses in their first year—approximately equivalent to payroll expenses for ten employees—in this segment.⁶
- **Stable micro**—Firms in this segment have either no or very few employees and do not exhibit behaviors consistent with growth intentions. We define the stable micro segment as containing those businesses that do not have electronic payroll outflows for six months of their first year and have less than \$500,000 in expenses.

In order to better inform a dynamic view of the economic contributions of different types of small businesses at different points in their life cycles, we analyzed revenue over time for a cohort of firms that opened their first account in 2013 (Farrell et al., 2018b). Figure 9 shows the total share of firms and the aggregate revenue produced by firms in this cohort after one and four years for each of our four segments.

Figure 9: Number of firms and aggregate revenue by small business segment

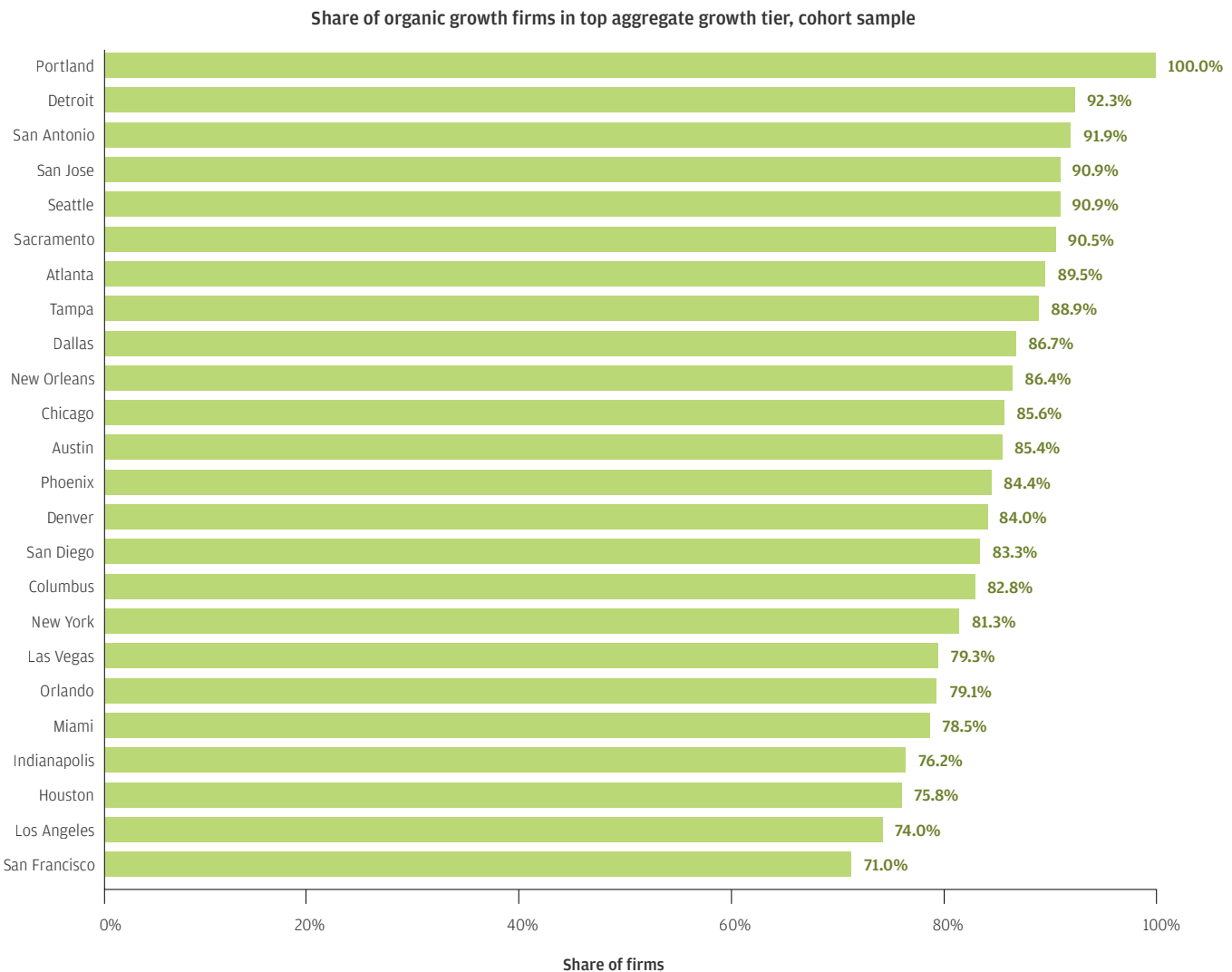


Among one-year-old firms, organic growth firms were the most common type of firm at 54 percent, and at 40 percent these firms also generated the largest share of revenue. Financed growth firms were the smallest share of firms by count at only 3 percent, but generated a disproportionately large 21 percent share of revenue. Stable micro businesses were the second largest share of one-year-old businesses at 29 percent and generated a relatively large share of revenue at 17 percent. In our sample one-year-old stable small employer firms only accounted for 17 percent of aggregate revenue.

To this end, Figure 10 shows the share of organic growth firms in the top aggregate growth tier for each of the cities we analyzed.⁷ Even among the top 5 percent of firms by revenue growth contribution, the overwhelming majority of small businesses fell into the organic growth segment. We also found substantial differences in shares by city. Among the top 5 percent of firms by revenue growth contribution, the share of organic growth firms was nearly 30 percentage points higher in Portland than it was in San Francisco. Notably, even in San Francisco—a city well-known for financed high-tech firms—the share of organic growth firms was over 70 percent. Relative to their share in the cohort of new firms, organic growth firms were overrepresented among the top 5 percent of revenue growth firms.

Organic growth firms were overrepresented among the top 5 percent of revenue growth firms.

Figure 10: Organic growth firms dominate the top 5 percent of highest growth contributors across cities

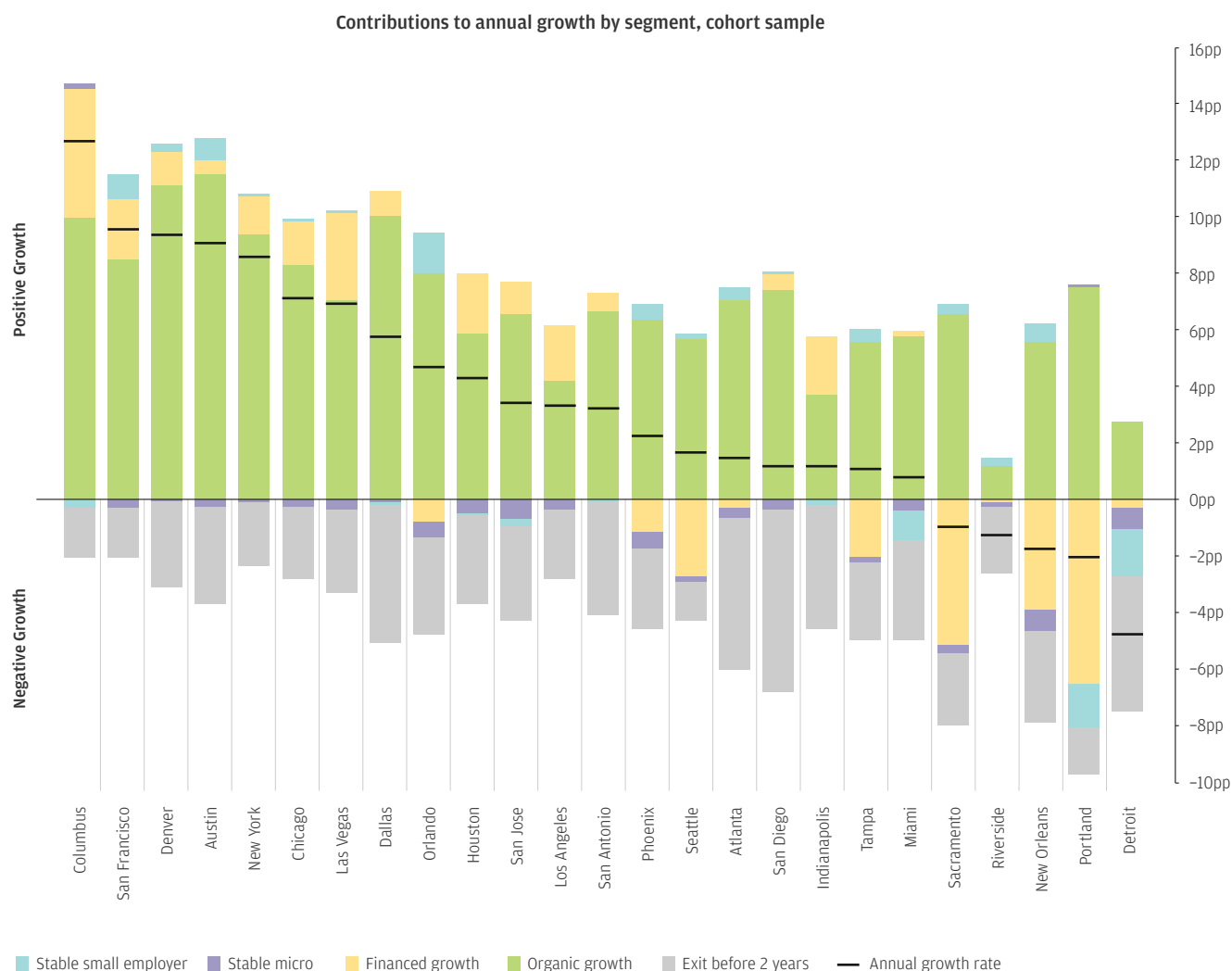


Note: Results for Riverside excluded due small sample size.

Source: JPMorgan Chase Institute

In addition to comprising a large share of the top 5 percent of revenue growth contributors, organic growth firms also were the most substantial drivers of aggregate revenue growth for the overall 2013 cohort. Figure 11 presents the contributions to aggregate revenue growth from each of the four segments in each of our 25 cities. In each city, organic growth firms made the largest contributions to aggregate revenue growth, reinforcing the view that the small business sector can grow without a heavy dependence on external financing mechanisms. Organic growth firms in Columbus, Denver, and Austin made especially large positive contributions to aggregate revenue growth. Financed growth firms made smaller contributions to aggregate growth. In several cities—notably Sacramento, Portland, and New Orleans—financed growth firms made negative contributions to growth. Columbus, the city with the highest growth rate, had high growth contributions from both organic and financed growth firms. However, Denver and Austin did not show a particularly high contribution of financed growth firms. New Orleans, Portland, and Detroit had financed growth firms that made negative growth contributions to revenue growth.

Figure 11: Organic growth firms contribute the most to overall revenue growth



Note: Annual growth rate reflects annualized aggregate growth rate from 2013 to 2017. The “exits before two years” segment captures firms that exit without the two full years of revenue necessary to compute a revenue growth rate.

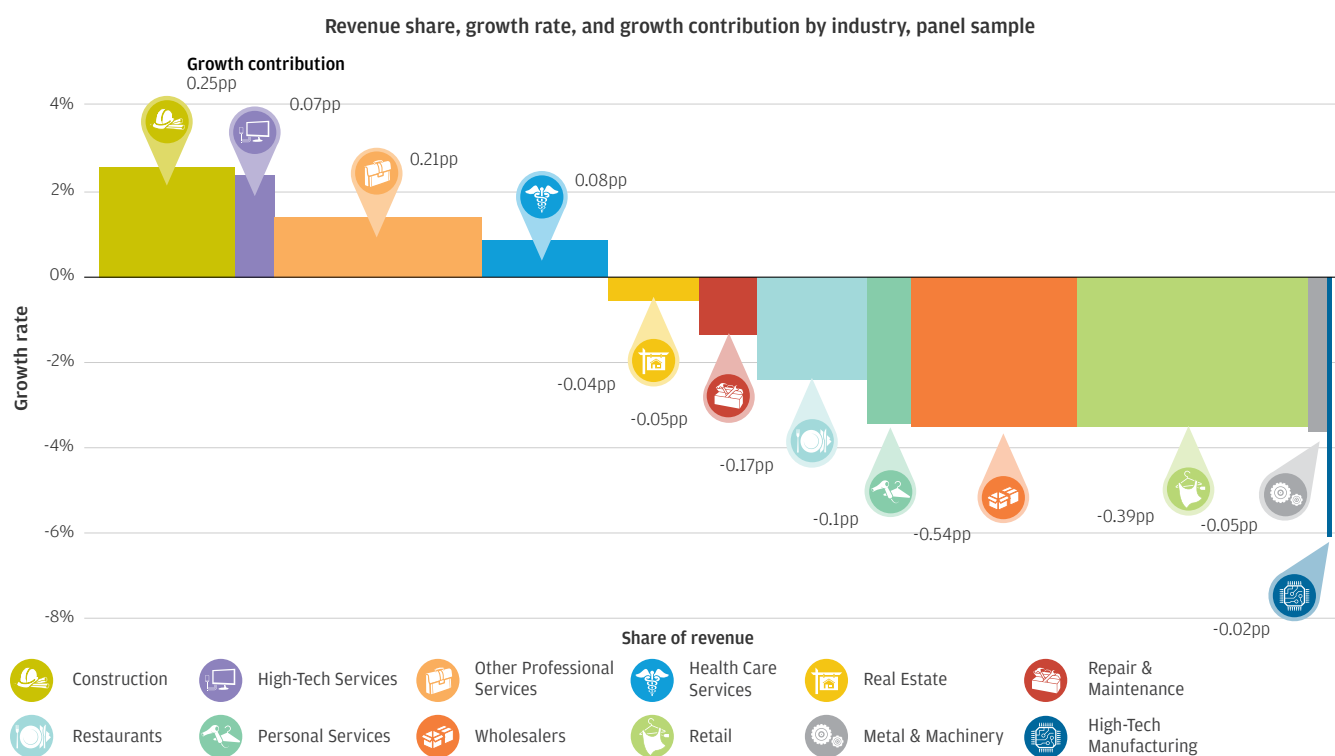
Source: JPMorgan Chase Institute

Finding Three

While revenue growth rates vary substantially by industry across cities, small firms in construction, other professional services, health care services and high-tech services drive aggregate growth in most cities

Observers of the small business sector often cite industry composition as a key driver of differences in its financial and economic outcomes between cities. For example, cities with a higher share of workers employed in knowledge-intensive industries exhibit a higher concentration of high growth firms (Hathaway, 2018). Indeed, investments in clusters of small businesses in related industries play an important role in driving the economic growth of the sector (JPMorgan Chase and ICIC, 2014), particularly among employer firms. Moreover, while researchers disagree as to whether there are persistent industry differences in profitability in businesses of all sizes (Schmalensee, 1985; Rumelt, 1991; McGahan and Porter, 1997, 2002), evidence suggests that specific differences in small business performance by industry may persist (Heston & Rouwenhorst, 1995). Moreover, the effect of geography may be equal to if not larger than the effect of industry—the connection between average establishment size and subsequent entrepreneurship is empirically stronger at the city-industry level than on either dimension individually (Glaeser et al., 2010). While these results suggest the importance of considering the interaction of industry and city characteristics on small businesses growth, little research has specifically explored how these factors drive revenue growth in the small business sector, particularly in the context of both employer and nonemployer businesses.

Figure 12: Industries that grew the fastest did not contribute the most to aggregate revenue growth



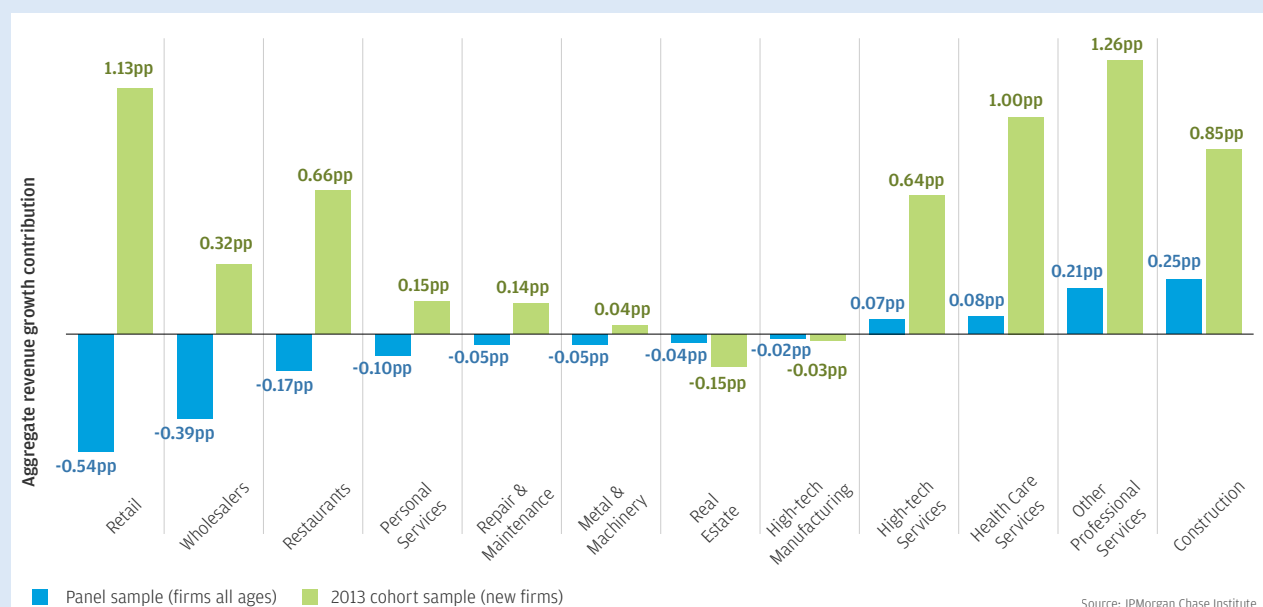
To this end, we analyze contributions from each of these industries to revenue growth, and then the revenue growth across 12 key small business industries⁸ in our panel sample of firms of various ages. Figure 12 illustrates this by presenting revenue growth rates and revenue shares for firms of all ages in our sample (Box 2 discusses differences in revenue growth contributions between new firms and firms of all ages). The height of each box in the figure corresponds to the growth rate for an industry, the width corresponds to revenue share, and the area of the box reflects growth contribution. The industries are ordered by their growth rate, Construction and High-Tech Services grew the fastest with growth rates close to two percent annually, while Metal & Machinery and High-Tech Manufacturing had the lowest growth rates, at less than negative five percent annually. The overall area is the contribution of that industry to growth. The figure shows that the industries that made the largest absolute contributions are typically the industries with large shares—Construction and Other Professional Services in terms of positive contributions, and Wholesalers and Retail in terms of large detractions. While industries such as high tech services, metal and machinery, and high-tech manufacturing grew relatively quickly or declined relatively sharply, they did not contribute as much to overall growth given their small size relative to other industries.

Box 2: Aggregate revenue growth contributions of new firms and all firms

Contributions to aggregate revenue growth vary not only by industry, but also by the age of the firm. As we illustrated in Finding 1, all net revenue growth in the small business sector between 2013 and 2017 was generated by new small businesses. This pattern generally holds within industries as well.

Figure 13 presents revenue growth contributions by industry for both the cohort and the panel sample. The green bars show revenue contributions in the cohort sample of new firms founded in 2013, and the blue bars show revenue contributions in the panel sample of firms of all ages. In both samples, the results show that industries made meaningfully different contributions to aggregate small business revenue growth, consistent with the view that industry mix might explain differences in city-level outcomes. While nearly every industry made positive contributions to growth among new firms, only four made positive contributions in the full sample—Construction, Other Professional Services, Health Care Services, and High-Tech Services. This expands on the observation in Finding 1 that new firms accounted for all positive revenue contributions, while the full population of firms experienced aggregate revenue declines over this period.

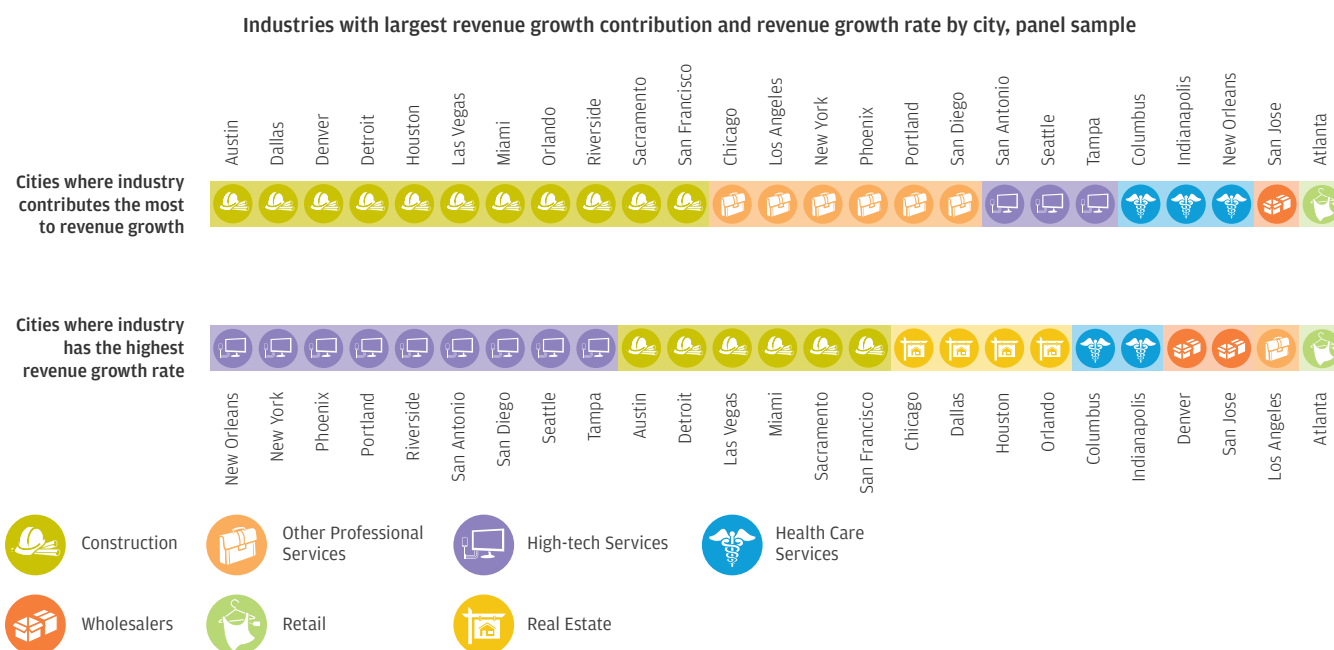
Figure 13: Revenue growth decomposition by industry, 2013-2017



Notably, while new small retailers make the second largest positive contributions to aggregate revenue growth, small retailers are the largest detractor from growth among firms of all ages. The fact that retail firms of all ages are experiencing negative growth sheds light on the difficulty of that industry to keep growing once the early stages in their lifecycle characterized by high growth and exit had passed. This implies that young and mature retail firms are seeing sharp declines in revenue, consistent with observations about the impact of changes in technology on the retail sector (Farrell et al., 2018a).

The industries that made the largest positive and negative contributions to aggregate revenue growth across cities—Construction, Other Professional Services, Restaurants, Wholesalers, and Retail—are not industries typically thought of as distinctively present or absent in specific cities. This suggests that these industries may drive revenue growth in individual cities as well. To explore this possibility, for each city we identified the industry that made the largest positive and negative contribution to aggregate revenue growth. Figure 14 first identifies the industry with the largest growth contribution among small businesses of all ages across all 25 cities in our sample.

Figure 14: Top contributing industries to revenue growth were more concentrated than fastest growing industries



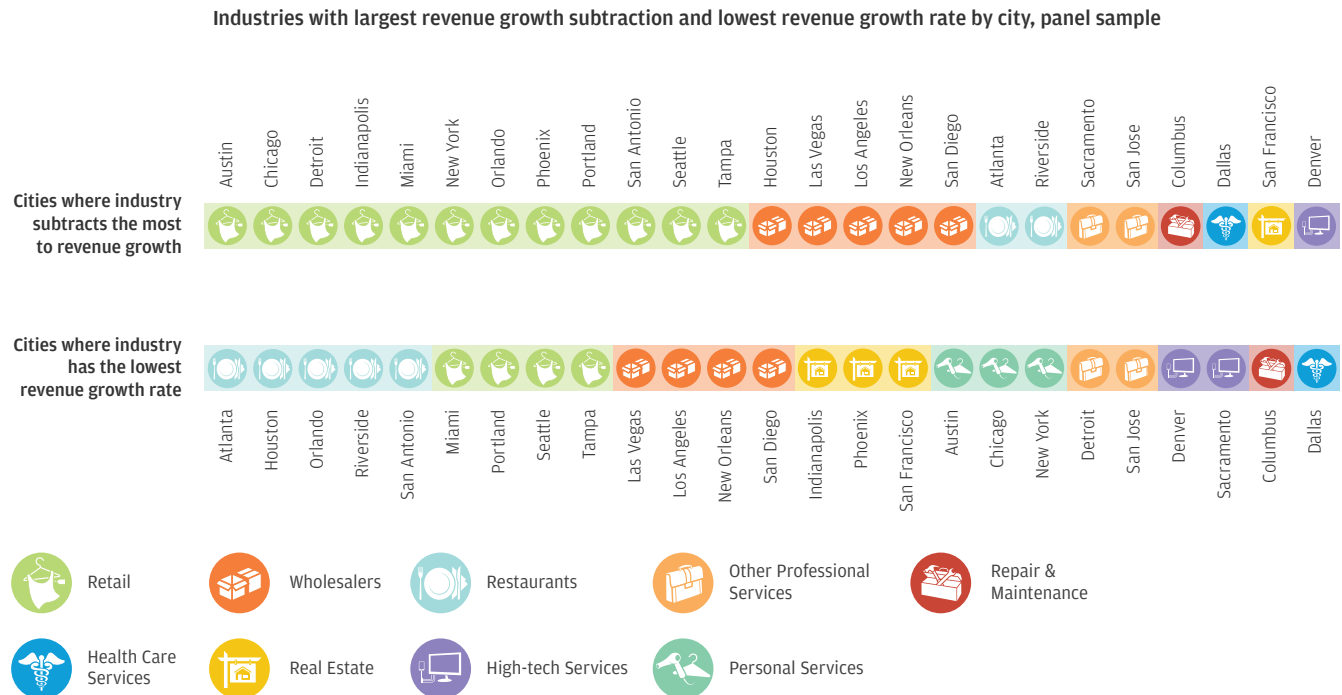
Note: High-Tech Manufacturing and Metal & Machinery industries excluded due to small sample size.

Source: JPMorgan Chase Institute

The industries that made the largest contributions to aggregate revenue growth across cities were also the industries that made the largest contributions in individual cities. The construction industry was the largest overall contributor to aggregate revenue growth, and it was the largest contributor in eleven of our 25 cities. Other Professional Services was the largest contributor in six cities, Health Care Services and High-Tech Service were the largest contributors in three cities, and Wholesalers, and Retail are the largest in one city each. Contrary to a common belief that High-Tech Services is the only industry that drives growth, Figure 14 shows that only San Antonio, Seattle, and Tampa had High-Tech Services as the largest contributor to growth for small businesses. Although High-Tech Services is clearly a dynamic and growing sector in many cities, Construction and Other Professional Services made larger contributions to the overall growth of the sector across cities due to their larger relative share of revenues.

Figure 14 also shows the industry with the fastest aggregate revenue growth rate for each of the 25 cities in our sample. The industries that led revenue growth rates were substantially less concentrated than those that led revenue contributions. There was substantial variation across cities—nine of our 12 industries appear as a leading industry in at least one city. Some industries were more common as aggregate revenue growth rate leaders than others—the high-tech services industry grew the fastest in seven cities, the construction industry grew the fastest in six, and real estate firms grew fastest in four. In contrast, the wholesalers, other professional services, and retail industries grew the fastest in only one or two cities.

Figure 15: Top detracting industries to revenue growth were more concentrated than slowest growing industries



Note: High-Tech Manufacturing and Metal & Machinery industries excluded due to small sample size.

Source: JPMorgan Chase Institute

We found a similar pattern among industries that detracted from aggregate revenue growth. As Figure 12 indicates, eight of the 12 industries we analyzed had negative growth rates and subtracted from aggregate revenue growth overall. Figure 15 explores variation at the city level by showing the industry that detracts the most from growth for each city, as well as the industry with the lowest revenue growth rate. Consistent with our across-city result, the retail industry subtracted the most from growth in twelve of twenty-five cities. However, there is also some variation across cities—there are five cities where the wholesale industry subtracted the most from aggregate revenue growth.

While the industry with the fastest growing or fastest declining revenue growth varied meaningfully by city, there were nevertheless broadly consistent patterns. Figure 16 presents aggregate revenue growth rates for all 25 cities for six industries that comprise enough revenue share to shape overall revenue growth. In particular, Figure 16 also contrasts cities in which a given industry grew with those in which the industry saw revenue declines. The construction and high-tech services industries grew in most places—in over 75 percent of cities, small businesses in these industries generated positive aggregate revenue growth. Other Professional Services and Real Estate were more mixed—small businesses in both of these industries had aggregate revenue growth in 13 cities and aggregate revenue declines in 12. Notably, the two industries with the highest growth across cities were growing in nearly all cities; however, growth in Professional Services, the third fastest growing industry, was not as widespread across cities. In contrast, Restaurants and Retail had declining revenues in most places—small businesses in these industries generated aggregate revenue declines in over 80 percent of cities.

Figure 16: Construction and High-Tech Services grew consistently across cities, while Restaurants and Retail consistently declined

	Growing in more than 75% of cities		Growing in 50% of cities		Declining in more than 80% of cities		Total Growth Rate
	Construction	High-Tech Services	Other Professional Services	Real Estate	Restaurants	Retail	
San Francisco	↑	↑	↑	↓	↑	↓	2.6%
Portland	↑	↑	↑	↑	↓	↓	2.0%
Columbus	↑	↑	↑	↑	↓	↓	1.7%
San Jose	↑	↑	↓	↓	↑	↑	1.7%
Denver	↑	↓	↓	↑	↓	↓	1.6%
Riverside	↑	↑	↑	↑	↓	↑	1.5%
Seattle	↑	↑	↑	↑	↓	↓	1.0%
Chicago	↑	↑	↑	↑	↓	↓	0.4%
Atlanta	↑	↑	↓	↓	↓	↑	0.1%
Dallas	↑	↑	↑	↑	↓	↓	-0.1%
Las Vegas	↑	↓	↓	↓	↓	↑	-0.1%
Los Angeles	↓	↓	↑	↓	↓	↓	-0.3%
Austin	↑	↓	↑	↑	↓	↓	-0.3%
Phoenix	↑	↑	↑	↓	↓	↓	-0.7%
New York	↑	↑	↑	↓	↓	↓	-0.8%
Orlando	↑	↑	↓	↑	↓	↓	-0.9%
San Diego	↓	↑	↑	↑	↑	↓	-1.5%
Miami	↑	↑	↑	↓	↓	↓	-1.8%
Tampa	↑	↑	↓	↓	↓	↓	-1.8%
New Orleans	↓	↑	↓	↓	↓	↓	-2.1%
Houston	↑	↓	↓	↑	↓	↓	-2.5%
Detroit	↑	↑	↓	↓	↑	↓	-2.5%
San Antonio	↓	↑	↓	↑	↓	↓	-2.6%
Sacramento	↑	↓	↓	↓	↓	↓	-2.7%
Indianapolis	↓	↑	↓	↓	↓	↓	-3.9%

↑ Positive growth ↓ Negative growth

Note: Aggregate revenue growth reflects annualized growth rate from 2013 to 2017. High-Tech Manufacturing and Metal & Machinery industries excluded due to small sample size.

Source: JPMorgan Chase Institute

Finding Four

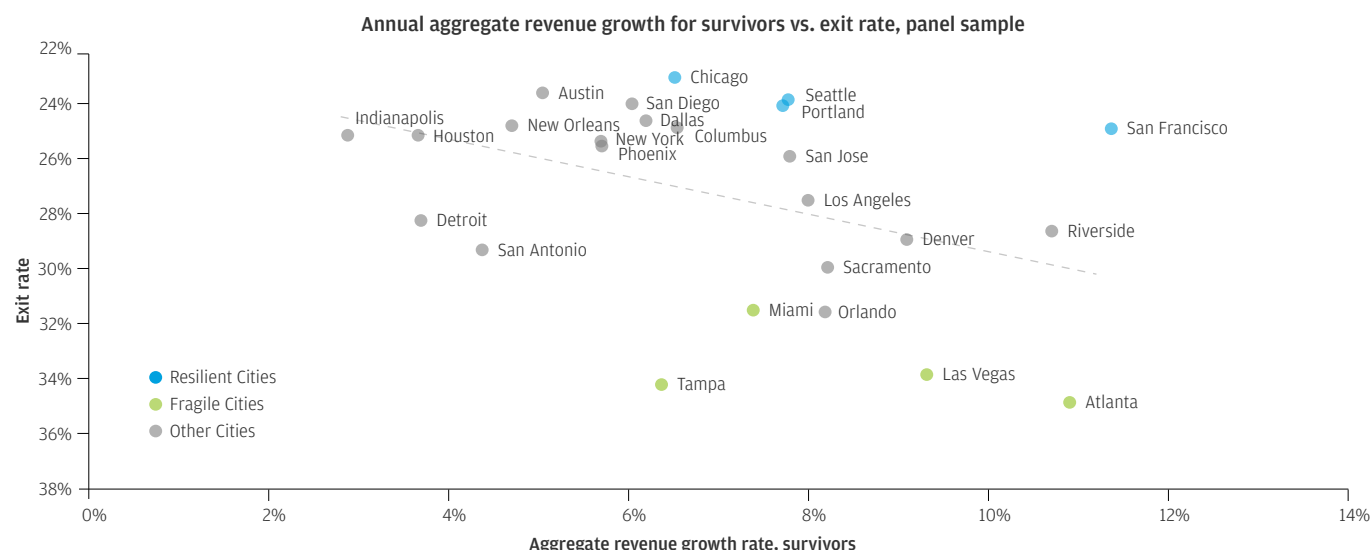
Across cities, retail and other professional services firms drive small business exits

While the small business sector often is praised for the high growth rates achieved by small firms, the sector is equally if not more so criticized for its high exit rates. Job losses due to exiting firms play a material role in limiting net job creation (Fredland and Morris, 1976; Decker et al. 2014, 2016). Moreover, as we illustrated in previous findings in this report, revenue losses due to firm exits substantially limit aggregate revenue growth in the sector.

In this sense, exit rates are a critical feature of the economic character of the small business environment in a city, especially when considered in combination with aggregate revenue growth rates. At the individual firm level, firms that experience high revenue growth might do so because they pursued higher-risk strategies, but also experience a higher risk of failure as a result. Knowledge gaps and uncertainty are both inherent to small business growth and a risk factor for a potential failure (Shepherd et al., 2000; Deakins and Freel, 1998). Policies, regulations, and other institutions might vary across cities in ways that might induce greater or less risk-taking among new small businesses, resulting in different overall distributions of growth and exit outcomes across cities. Such a model would suggest that in cities with higher risk firms, revenue growth might be higher, particularly among firms that do not exit, but that exit rates might be higher as well. Put differently, we might expect to observe a tradeoff between revenue growth rates of survivors and exit rates of other firms.

Figure 17 depicts the relationship between aggregate revenue growth rates for new firms that survive four years and rates of exit for new firms within the first four years for the 25 cities in our sample. Overall, we observed the expected trade-off in the cities selected for this analysis. Some cities, like Atlanta and Las Vegas, had high exit rates, but the firms that survived generated high aggregate revenue growth rates. In contrast, in cities like New Orleans and Indianapolis, small businesses were less likely to exit in their early years, but surviving firms generated less aggregate revenue growth.

Figure 17: Resilient cities have low exit rates relative to their revenue growth, while fragile cities have relatively high exit rates



Note: Aggregate revenue growth reflects annualized growth rate from 2013 to 2017. Exit rate is the share of firms active in 2013 that were no longer active in 2017.

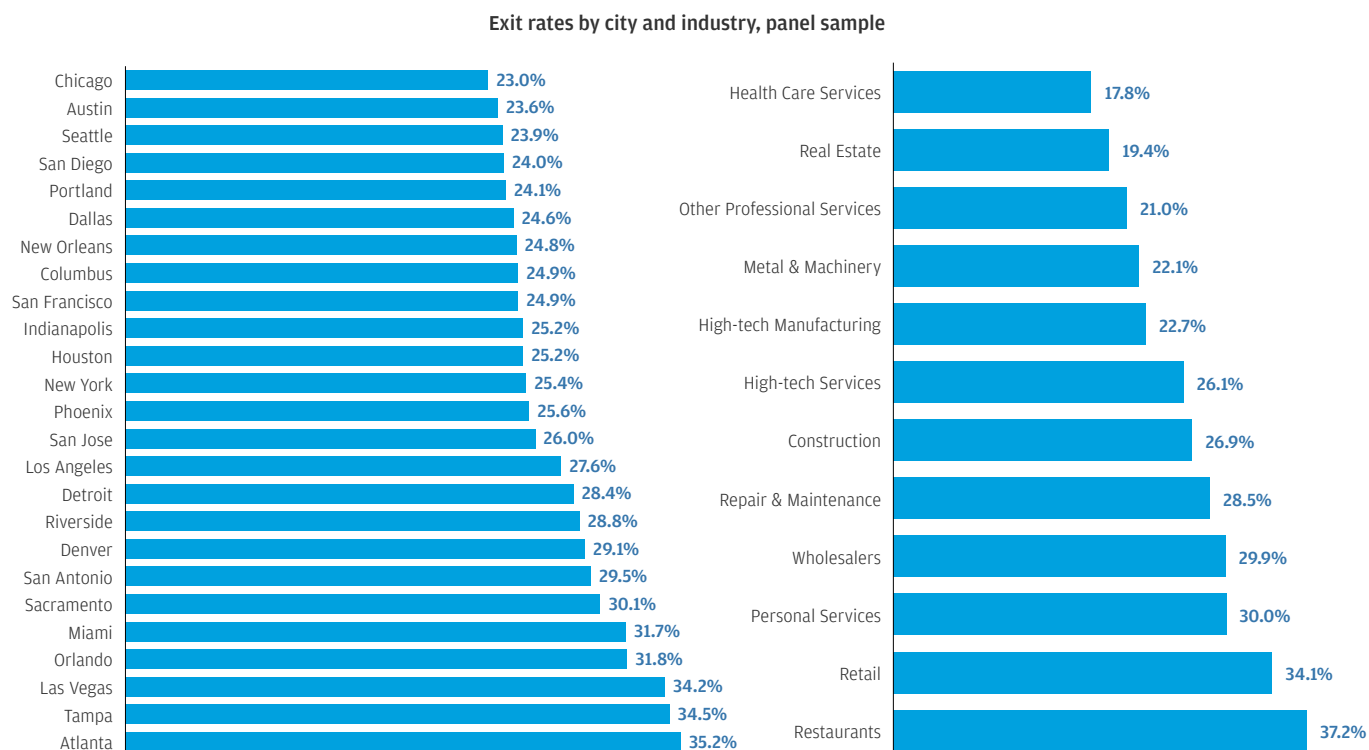
Source: JPMorgan Chase Institute

We also observe a few cities that stand out from the overall trend, either because they do not exhibit a tradeoff between exit and growth, or because their exit level is substantially higher than that of other cities with similar revenue growth rates (see Appendix for details of how we identify these cities). We label cities closer to the upper right corner of Figure 17 as “resilient” cities. In these cities—Chicago, Portland, San Francisco, and Seattle—small businesses had relatively low exit rates, while surviving firms generated high rates of aggregate revenue growth. In contrast, we label the four cities at the bottom of Figure 17—Atlanta, Las Vegas, Miami, and Tampa as “fragile”. Small businesses in these cities exited at a relatively high rate compared to cities in which surviving firms had similar growth rates.

To what extent are city-level differences in exit rates driven by industry composition? Industry effects—with a particular focus on presence of high-tech industries—are often cited as an explanation of productivity outcomes between cities (Longman, 2015; Florida, 2017). However, relatively little empirical research has tied city-level differences in small business exit rates to industry composition. Notably, small business exit rates varied more by industry than they did by city in our sample, as depicted in Figure 18. The restaurant industry had an exit rate slightly higher than that of Atlanta, the city with the highest exit rate, and four industries—Other Professional Services, Metal and Machinery, Real Estate, and Health Care Services—all had exit rates lower than Chicago's, the city with the lowest exit rate. This wide variation suggests that differences between fragile and resilient cities might be driven principally by the differential presence of these industries within these cities.

Small business exit rates varied more by industry than by city.

Figure 18: Exit rate variation by industry was greater than exit rate variation by city



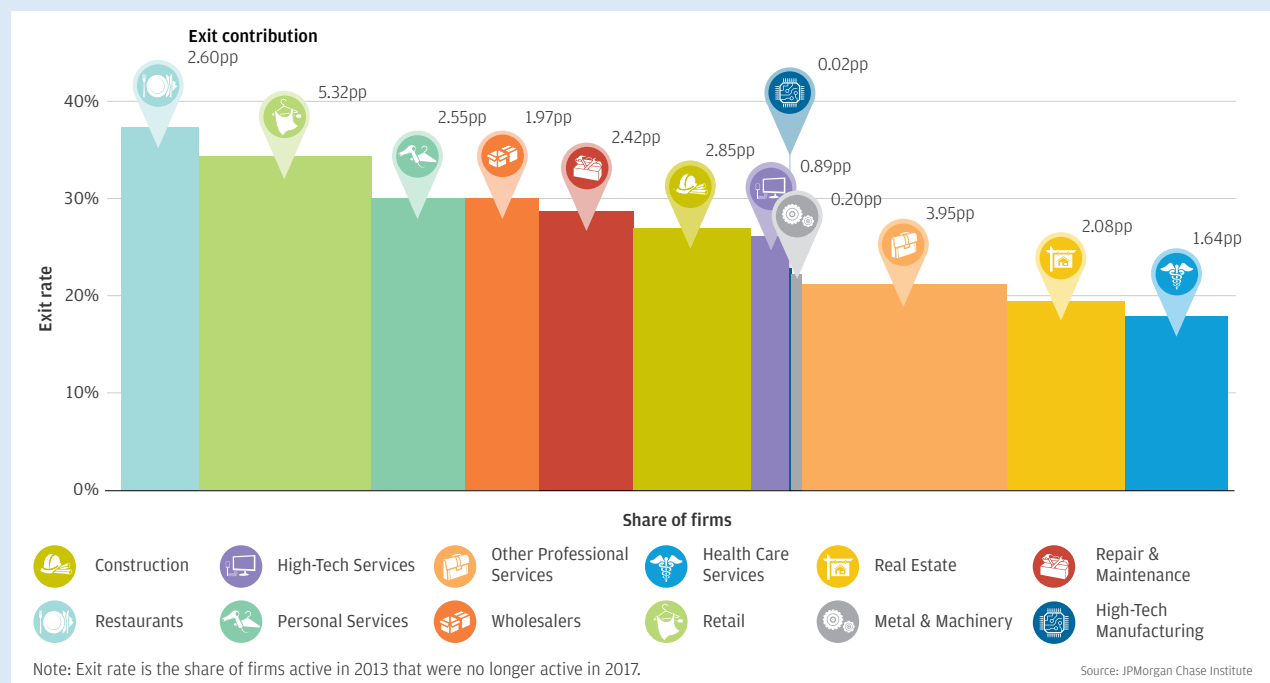
Note: Exit rate is the share of firms active in 2013 that were no longer active in 2017.

Source: JPMorgan Chase Institute

Box 3: Exit contributions by industry

Exit contribution is a metric that shows the extent that exits in an industry drives the overall exit rate. It weighs the exit rate of a specific industry against its share of firms. For example, an industry can have a high exit rate of 70 percent but represent less than one percent of firms, and as a result will contribute few overall exits. In contrast, another industry that has an exit rate of 10 percent but represents 90 percent of firms will contribute many more exits. Figure 19 illustrates this by presenting exit rate and industry share for our panel sample. The height of each box in the figure corresponds to the exit rate for an industry, the width corresponds to its share of firms, and the area of the box reflects its exit contribution. The industries are ordered by their exit rate, Restaurants and Retail have the highest exit rate, while Health Care Services and Real Estate have the lowest exit rate. The overall area is the contribution of that industry to exit. The figure shows that the industry that makes the largest absolute contribution has both a large share and exit rate—Retail. Other industries with large contributions include other professional services, construction, and restaurants. Industries such as high-tech services, metal and machinery, and high-tech manufacturing did not contribute as much to overall exit given their small size relative to other industries.

Figure 19: Exit rate, share and contribution, panel sample



This possibility notwithstanding, we found broad similarities in industry contributions to small business exits across cities. For each of the four fragile and four resilient cities, Figure 20 indicates the three industries that contributed the most to exit rates and the three that contributed the least to exit rates. Across both fragile and resilient cities, Retail and Other Professional Services were among the top three contributors to small business exit. There were also similarities in the industries that contribute least to small business exit—High-Tech Services, Health Care Services, and Wholesalers were prevalent in this role in both fragile and resilient cities. Notably, these industries contributed relatively little to small business exits while comprising relatively large shares of firms. The industry that most differentiated resilient and fragile cities in terms of exit rate contribution was the construction industry. In Portland, Seattle, and Chicago—all resilient cities with a relatively high share of construction firms (see Appendix for details)—the industry contributed the third highest share of exits.

Figure 20: Top industries contributing most and least to exit in fragile and resilient cities

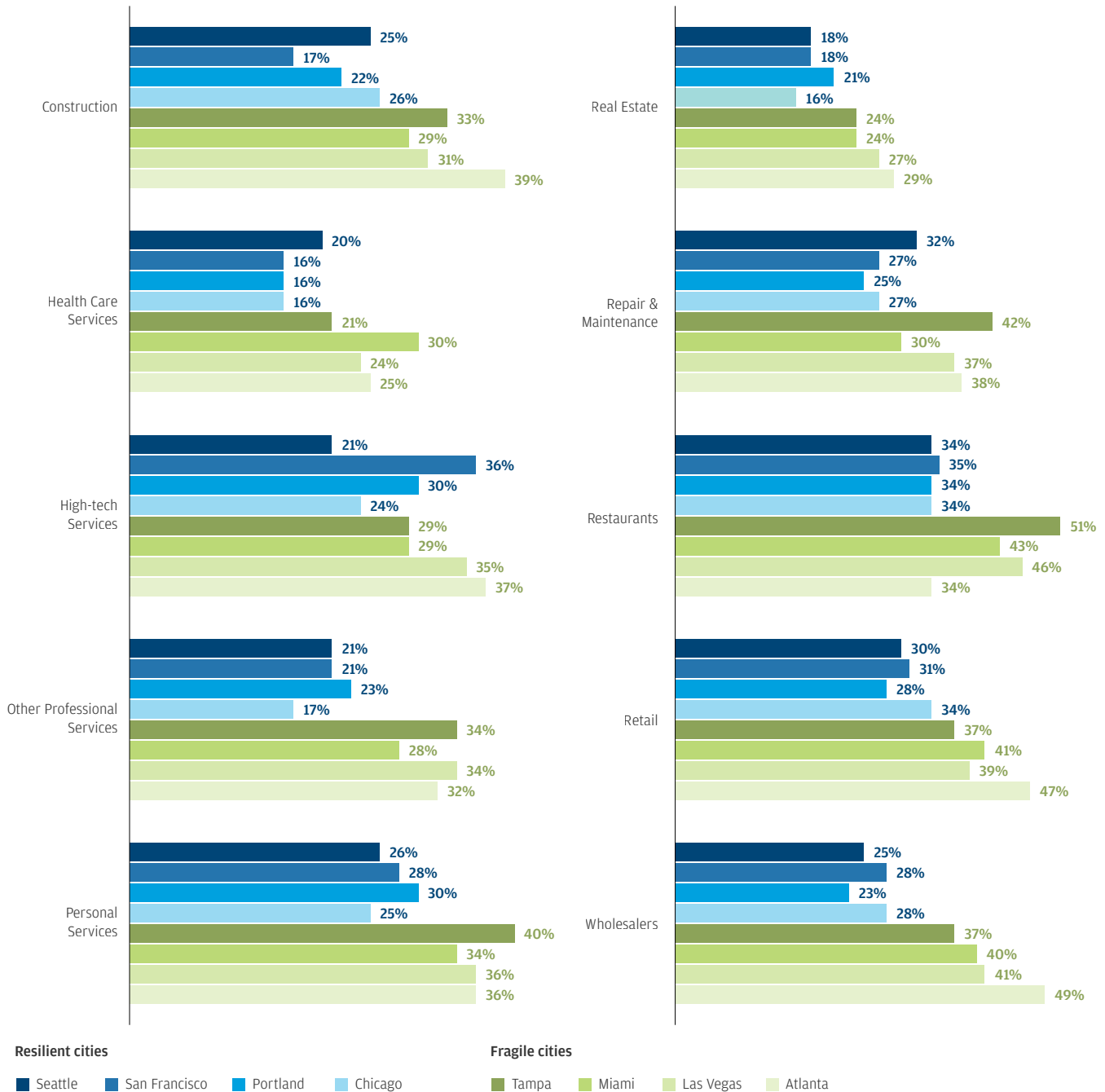
Fragile cities					Resilient cities			
Top three highest exit contributors	Atlanta	Tampa	Las Vegas	Miami	San Francisco	Portland	Seattle	Chicago
	Other Professional Services	Repair & Maintenance	Other Professional Services	Retail	Other Professional Services	Other Professional Services	Other Professional Services	Retail
	Retail	Retail	Retail	Other Professional Services	Retail	Retail	Retail	Other Professional Services
	Personal Services	Other Professional Services	Repair & Maintenance	Wholesalers	Restaurant	Construction	Construction	Construction

Fragile cities					Resilient cities			
Top three lowest exit contributors	Atlanta	Tampa	Las Vegas	Miami	San Francisco	Portland	Seattle	Chicago
	Health Care Services	High-Tech Services	High-Tech Services	High-Tech Services	Wholesalers	Health Care Services	Wholesalers	Health Care Services
	Restaurants	Health Care Services	Health Care Services	Restaurants	Health Care Services	High-Tech Services	Health Care Services	Wholesalers
	High-Tech Services	Wholesalers	Wholesalers	Health Care Services	Construction	Real Estate	Real Estate	High-Tech Services

Source: JPMorgan Chase Institute

While the industries that contributed the most and least to exit were broadly similar across fragile and resilient cities, exit rates for the same industry between these two groups of cities differed substantially. For example, though the retail industry was a top contributor to exit across cities, retail firms in Atlanta—a fragile city—were almost twice more likely to exit than in Portland, a city with resilient firms. Figure 21 shows the wide variation between fragile and resilient city exit rates. Within industries, resilient cities consistently had lower exit rates than their fragile counterparts. In Retail and Other Professional Services, the two industries that contribute the most to exit, all fragile cities had a higher exit rate than all resilient cities. The only exception was High-Tech Services where San Francisco, a city with resilient firms, had exit rates that were as high as those of fragile cities.

Figure 21: Industries had higher exit rates in fragile cities than in resilient cities in nearly all cases



Note: High-Tech Manufacturing and Metal & Machinery industries excluded due to small sample size.

Source: JPMorgan Chase Institute

Conclusions and Implications

Our unique administrative data provide a lens on aggregate revenue growth and exit rates—two key dimensions that characterize the economic health of the small business sector across cities. Aggregate revenue growth not only implies returns to the families that own small businesses, but increased utility among residents who consume their goods and services, as well as potential fiscal gains. Along similar lines, small business exits can represent economic losses for households, lost economic vitality in neighborhoods, and a declining fiscal base. By characterizing the drivers of aggregate revenue growth and exits in the small business sector across cities, our findings lead to four key conclusions and implications for small business decision makers:

- **Programs and policies focused on new small businesses in large and growing industries might be especially efficient in terms of aggregate revenue growth.** Aggregate revenue gains are mostly driven by new firms in industries with many rather than few small businesses. Industry-specific programs aimed at supporting new small businesses (e.g. accelerators) are common, but often focus on technology-intensive industries, which contain few small businesses. Similar programs targeted at new small construction and other professional services firms might reach larger numbers of businesses and generate substantial aggregate revenue gains.
- **Cities could promote aggregate revenue growth in the small business sector by targeting the specific financing needs of firms that grow organically in addition to those that grow with external finance.** Firms that grew organically drove an overwhelming majority of aggregate revenue growth in every city we analyzed. In contrast, firms using substantial amounts of external finance accounted for more than 15 percent of aggregate revenue growth in only in seven of these 25 cities. While policies and programs that promote access to investment finance for small businesses that need growth capital are surely important, small businesses that grow organically may have different needs, including but not limited to short-term working capital. Financial products targeted at these small businesses have the potential to drive substantial aggregate revenue growth, particularly in cities where financed growth firms are rare.
- **High exit rates among small retailers drive exit rates in the sector and may also erode the vitality of large city economies.** While both the retail and other professional services industries generate large numbers of exits in the small business sector, the retail industry is unique in both being large and having high exit rates. Small retailers are especially important contributors to urban economies, as they historically provided a diverse range of offerings that distinguished large cities from other places. To the extent that retail exits are driven in part by competition from online retailers, local economic developers who seek to retain this diversity might invest in programs to support the technological development of these small businesses.
- **While many cities achieve either high aggregate revenue growth or low exit rates, there may be opportunities to learn from cities that have achieved both.** Policies and programs that encourage risk-taking in the small business sector might both increase revenue growth among surviving firms and exit rates overall—a pattern we observe across many of the cities we analyzed. However, a few cities—San Francisco, Chicago, Seattle, and Portland—had relatively high revenue growth rates given their exit rates. To the extent that there are specific and transferrable small business programs and/or policies that enable growth without impairing survival in these cities, they could serve as useful models for broader adoption.

Data Asset and Methodological Appendix

Full sample – We constructed a sample of 290,000 firms who hold Chase Business Banking deposit accounts and meet our criteria for small operating businesses in core metropolitan areas. We then used over 1.2 billion anonymized transactions from these businesses to produce a daily view of revenues, expenses, and financing flows for the five years between October 2012 and February 2018. Criteria are as follows:

- Hold a Chase Business Banking account between October 2012 and February 2018
- Satisfy the following criteria for every month of at least one consecutive 12 month period:
 - Hold at most two business deposit accounts
 - End-of-day combined balances never exceed \$20 million and does not exceed \$20 million in revenue in first year of operations
 - Operate in one of the 12 industries that are characteristic of the small business sector: Construction, Health Care Services, Metals and Machinery Manufacturing, Real Estate, Repair and Maintenance, Restaurants, Retail, Personal Services (e.g. dry cleaning, beauty salons, etc.), Other Professional Services (e.g. lawyers, accountants, consultants, marketing, media, and design), Wholesalers, High-tech Manufacturing, and High-Tech Services
 - Operate in one of the central cities of the 25 metropolitan areas of the Growth, Vitality and Cash Flows: High-Frequency Evidence from 1 Million Small Business report (Farrell et al., 2018b). This report selected the top 25 metropolitan areas with the highest number of firms in our sample.
 - Show no evidence of operating in more than a single location or industry
- Satisfy criteria that indicate they are operating businesses by having, in at least one consecutive 12-month period, three months with the following activity in each month:
 - At least \$500 in outflows
 - At least 10 transactions

2013 Cohort – Out of those 290,000 firms, we identified a cohort of 45,000 firms that were founded in 2013. Our longitudinal view allows us to fully observe up to the first four years of these firms’ operation, ending in February 2018.

Employers – We classify firms as employers if, in a 12-month period, we observe electronic payroll outflows for at least six months out of those 12. We call firms that are not employers “nonemployers.” Ninety percent of firms in our sample of 1.3 million are never considered employers and 86 percent never have an electronic payroll outflow. For details on how we identify payroll outflows in our report on small business employment, consult Farrell and Wheat (2018).

Data Privacy

The JPMorgan Chase Institute has adopted rigorous security protocols and checks and balances to ensure all customer data are kept confidential and secure. Our strict protocols are informed by statistical standards employed by government agencies and our work with technology, data privacy, and security experts who are helping us maintain industry-leading standards.

There are several key steps the Institute takes to ensure customer data are safe and secure:

- The Institute's policies and procedures require that data it receives and processes for research purposes do not identify specific individuals or institutions.
- The Institute has put in place privacy protocols for its researchers, including requiring them to undergo rigorous background checks and enter into strict confidentiality agreements. Researchers are contractually obligated to use the data solely for approved research and are contractually obligated not to re-identify any individual or institution represented in the data.
- The Institute does not allow the publication of any information about an individual consumer or business. Any data point included in any publication based on the Institute's data may only reflect aggregate and/or scaled information.
- The data are stored on a secure server and can be accessed only under strict security procedures. The data cannot be exported outside of JPMorgan Chase's systems. The data are stored on systems that prevent them from being exported to other drives or sent to outside email addresses. These systems comply with all JPMorgan Chase Information Technology Risk Management requirements for the monitoring and security of data.

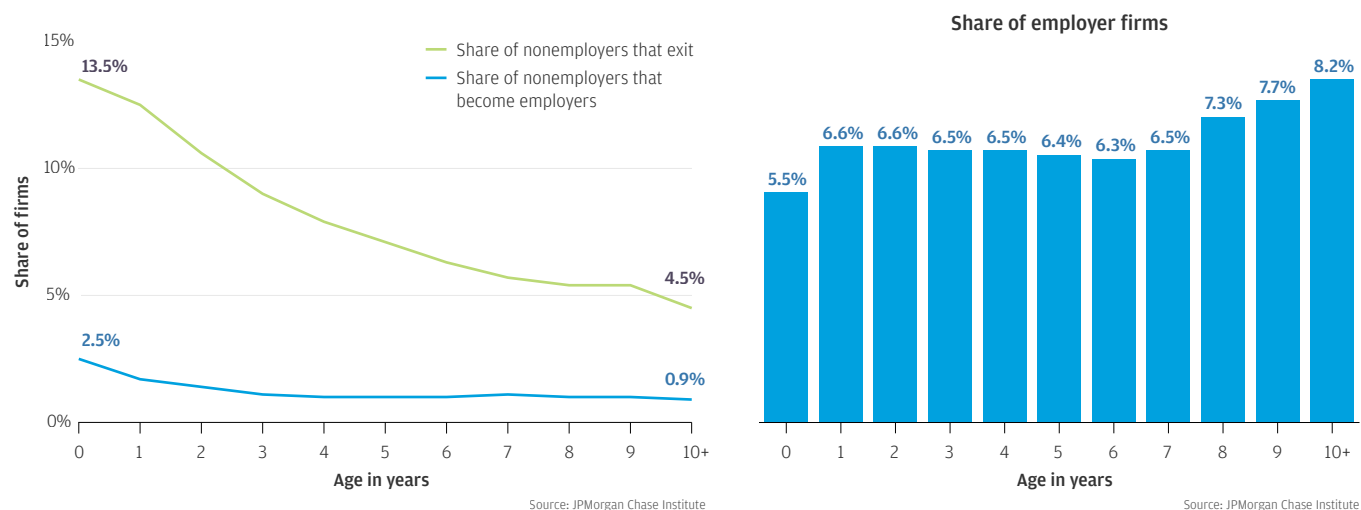
The Institute provides valuable insights to policy makers, businesses, and nonprofit leaders. But these insights cannot come at the expense of customer privacy. We take precautions to ensure the confidence and security of our customers' private information.

Employer dynamics in our sample

A previous report on small business growth and vitality provided evidence about the share of firms that are employers by age and the most common transitions of non-employers (Farrell et al., 2018b). Figure A1 (left panel) shows that for the first ten years, the exit rate for nonemployer businesses is substantially higher than the rate at which nonemployers become employer businesses. Moreover, at 2.6 percent, this rate is substantially higher for firms less than a year old than it is for firms at any other age⁹. Small businesses are most likely to transition to employment early on in their careers—after even five years, this rate drops to 1 percent, and drops to 0.9 percent for firms ten years and older. Nonemployer businesses are unlikely to transition to employment, and are even less likely to do so as they age.

One consequence of these nonemployer dynamics is that the share of employer firms grows as a cohort of small businesses age. Figure A1 (right panel) shows the share of employer firms by business age as the result of a cross-sectional analysis. The share of small employer small businesses is less than 7 percent for businesses younger than eight years, and over 7 percent for businesses at least eight years old. Our longitudinal analyses make it clear that this result does not follow from nonemployer businesses transitioning to employment as they age, but rather from higher exit rates among nonemployers as compared to small employer businesses.

Figure A1. Nonemployer transitions and share of employer firms



Identifying fragile and resilient cities

In order to identify which cities were fragile and resilient, we ran a regression using Ordinary Least Squares (OLS) with the following functional form:

$$Y = B_0 + XB_1 + \epsilon$$

where Y is the exit rate and X is the revenue growth rate of survivor firms. We used the regression to estimate predicted exit rates using the model parameters and we calculated the differences between the actual and predicted exit rate. The cities selected as standout cities were the ones that had an absolute difference of over 3.6 percentage points, the standard deviation of the exit rate across the 25 cities in the sample. Cities with a positive difference of over one standard deviation were labeled as Resilient and cities with a negative difference of over one standard deviation were labeled as Fragile. Figure A2 shows the results by city.

Figure A2. Model estimation

City	Actual Exit Rate	Predicted Exit Rate	Difference
Tampa	34.5%	27.4%	-7.1%
Atlanta	35.2%	30.3%	-4.9%
Las Vegas	34.2%	29.3%	-4.8%
Miami	31.7%	28.1%	-3.7%
San Antonio	29.5%	26.2%	-3.3%
Orlando	31.8%	28.6%	-3.2%
Detroit	28.4%	25.7%	-2.7%
Sacramento	30.1%	28.6%	-1.5%
Indianapolis	25.2%	25.2%	0.0%
Denver	29.1%	29.2%	0.1%
Houston	25.2%	25.7%	0.5%
Los Angeles	27.6%	28.5%	0.9%
Phoenix	25.6%	27.0%	1.4%
Riverside	28.8%	30.2%	1.4%
New Orleans	24.8%	26.4%	1.5%
New York	25.4%	27.0%	1.6%
San Jose	26.0%	28.4%	2.4%
Columbus	24.9%	27.6%	2.6%
Dallas	24.6%	27.3%	2.7%
Austin	23.6%	26.6%	3.0%
San Diego	24.0%	27.2%	3.2%
Portland	24.1%	28.3%	4.2%
Seattle	23.9%	28.3%	4.5%
Chicago	23.0%	27.5%	4.5%
San Francisco	24.9%	30.6%	5.7%

Source: JPMorgan Chase Institute

Industry Share by City for Fragile and Resilient Cities

Finding 4 made the claim that the differences in the industry contributions to exit of fragile and resilient cities were mainly attributed to notable differences in the exit rate. However, it could be the case that these differences were actually motivated by variations in the industry composition of these two groups of cities. In order to rule out that hypothesis, we took a look at the share of firms by industry and city and concluded that there were not clear differences in the industry composition between fragile and resilient cities. The only exceptions were Health Care Services where all resilient cities had a higher share of firms than fragile cities, and Repair & Maintenance where all fragile cities had a higher share than all resilient cities. Despite a larger share of firms, Health Care Services still was one of the industries that contributed the least to exit in resilient cities, which is a potential reflection of an overall low exit rate for Health Care Services.

Figure A3: Share of firms by industry in fragile and resilient cities

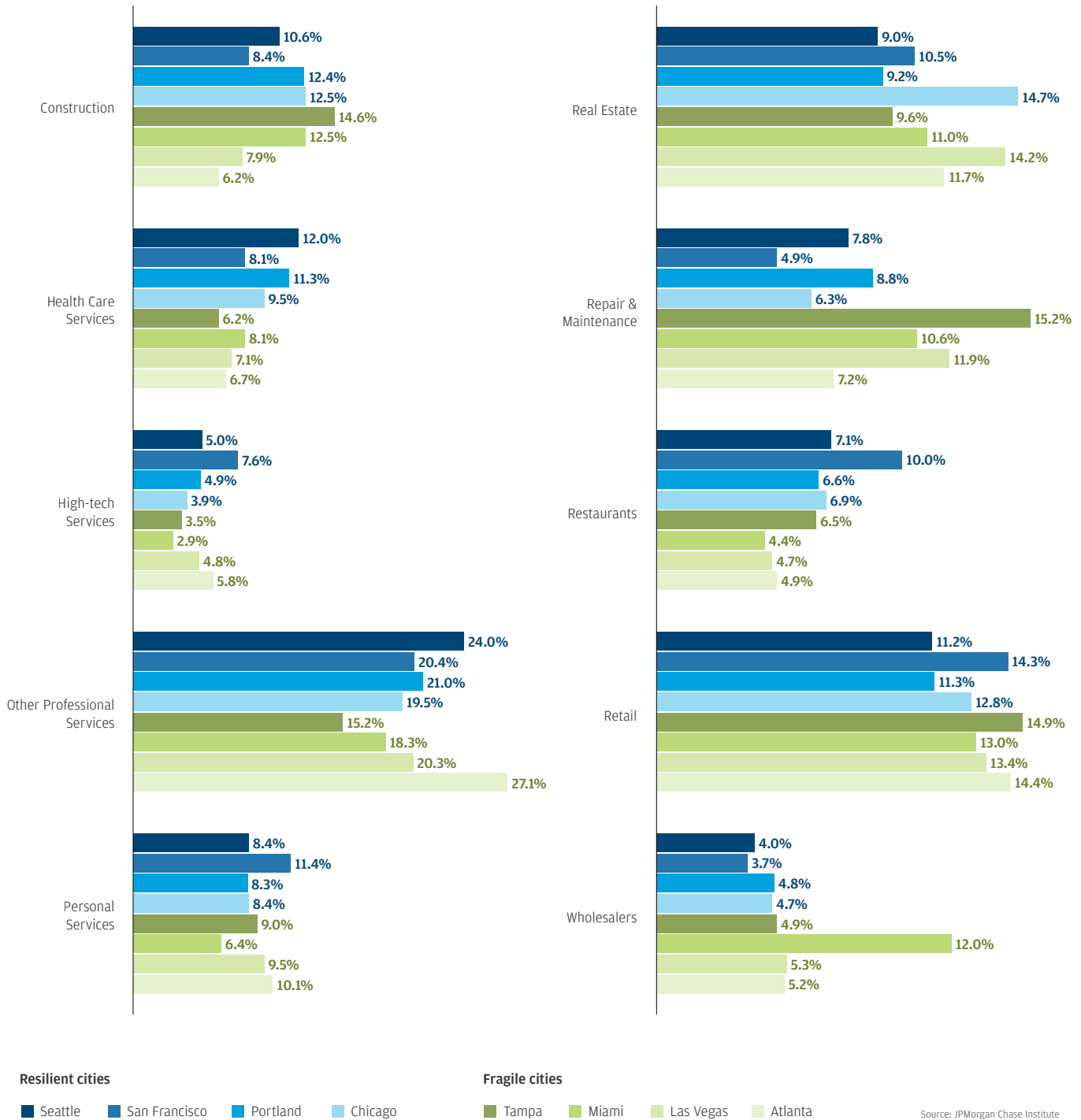


Figure A4: Revenue growth rate by industry across cities

	Growing in more than 75% of cities		Growing in 50% of cities		Declining in more than 80% of cities	
	Construction	High-Tech Services	Other Professional Services	Real Estate	Restaurants	Retail
San Francisco	13.5%	12.8%	2.4%	-8.1%	1.2%	-0.8%
Portland	5.7%	14.6%	5.3%	3.2%	-3.4%	-7.6%
Columbus	3.4%	4.5%	2.4%	3.7%	-2.7%	-1.3%
San Jose	4.8%	10.2%	-7.6%	-4.8%	2.7%	0.8%
Denver	5.5%	-12.8%	-0.4%	0.4%	-1.0%	-2.4%
Riverside	3.9%	8.9%	3.4%	1.9%	-13.7%	3.9%
Seattle	1.6%	7.9%	0.3%	0.2%	-1.2%	-3.1%
Chicago	1.9%	0.1%	2.1%	2.4%	-0.2%	-2.4%
Atlanta	7.6%	1.7%	-2.2%	-3.1%	-13.4%	10.4%
Dallas	4.9%	4.4%	2.2%	6.1%	-2.3%	-3.0%
Las Vegas	6.1%	-0.7%	-1.4%	-2.2%	-3.0%	1.5%
Los Angeles	-4.2%	-1.7%	8.0%	-1.0%	-3.1%	-3.9%
Austin	3.9%	-1.0%	1.3%	0.4%	-2.2%	-4.6%
Phoenix	1.3%	3.7%	1.6%	-6.9%	-2.6%	-3.4%
New York	2.2%	2.5%	2.1%	-0.5%	-1.8%	-3.9%
Orlando	3.6%	1.9%	-0.4%	3.7%	-7.6%	-4.8%
San Diego	-0.2%	8.9%	2.9%	0.3%	0.1%	-6.9%
Miami	6.6%	4.8%	1.3%	-4.8%	-5.7%	-7.3%
Tampa	2.5%	48.0%	-2.4%	-8.1%	-4.6%	-11.0%
New Orleans	-5.4%	9.0%	-1.1%	-9.5%	-8.2%	-0.7%
Houston	1.9%	-3.7%	-0.9%	2.8%	-6.7%	-3.5%
Detroit	7.3%	1.6%	-6.7%	-0.6%	5.2%	-6.5%
San Antonio	-2.0%	5.2%	-3.3%	1.2%	-7.1%	-4.1%
Sacramento	11.6%	-11.6%	-8.0%	-9.2%	-4.8%	-2.8%
Indianapolis	-1.7%	0.4%	-3.9%	-9.1%	-5.9%	-4.9%

Note: Aggregate revenue growth reflects annualized growth rate from 2013 to 2017.

Source: JPMorgan Chase Institute

Glossary

Annual revenue growth	A comparison of the aggregate annual revenue of all small businesses that were in our sample in 2013 to the aggregate annual revenue for that same sample of firms in 2017
Central city	The most populous city in a metro area, typically governed by a single political entity
Employer	A firm that had payroll outflows in at least six out of the past 12 months
Exit	A firm's closing of their deposit account, which we interpret as a firm's closure
Financed growth firms	Small businesses in our 2013 cohort that have at least \$400,000 in financing cash inflows in their first year after opening a deposit account
Firm	Our unit of analysis, one or more Chase Business Banking accounts identified as related businesses
Growth contribution	The product of a segment's growth and share of total revenue. Overall, segments with a large relative size (measured as revenue shares) and high growth will have the highest contributions to growth
Metro area	A geographic area that is defined by the Census as Core Based Statistical Area
Nonemployer	A firm that had payroll outflows in less than six out of the past 12 months
Organic growth firms	Small businesses in our 2013 cohort that do not have at least \$400,000 in financing cash inflows in their first year after opening a deposit account and achieve average annual revenue growth of at least 20 percent or average annual revenue decline of at least -20 percent from their first to last year
Stable micro firms	Small businesses that are neither financed growth nor organic growth firms and have fewer than six months of electronic payroll outflows in their first year and less than \$500,000 in expenses in their first year
Stable small employer firms	Small businesses that are neither financed growth nor organic growth firms and have a business model premised on the employment of others, implied by either electronic payroll outflows in six or more months in their first year or over \$500,000 in expenses in their first year

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Endnotes

- 1 The 2015 Census Nonemployer Statistics count 24.3 million nonemployer businesses, and the 2015 Census Statistics of US Businesses count 5.90 million employer businesses, 5.88 million of which have fewer than 500 employees.
- 2 The Patterns of Disparity series by the Woodstock Institute (Cowan 2017a, 2017b, 2017c, 2017) addresses small business financial outcomes with regional rather than city-level geographic units. The US Census Bureau Business Dynamics Statistics data identify local small business outcomes in terms of births, deaths, and job creation, but at the CBSA rather than city level.
- 3 See for instance: https://www.federalreserve.gov/newsevents/speech/brainard20170926a.htm?mod=article_inline.
- 4 The US Census Bureau Business Dynamics Statistics measures businesses with paid employees. <https://www.census.gov/ces/dataproducts/bds/methodology.html>.
- 5 For example, the SBA Small Business Investment Company program provides debt and equity finance to small businesses, typically ranging from \$250,000 to \$10 million for financing that includes debt, with an average award of \$3.3M in FY2013 <https://www.sba.gov/funding-programs/investment-capital> https://www.sba.gov/sites/default/files/files/SBIC_Annual_Report_FY2013_508Compliant_1.pdf. In our data, \$400,000 reflected approximately the 95th percentile of annual financing inflows among businesses in our sample for which we observed any financing inflows at all.
- 6 We classify firms with more than \$500,000 in expenses as likely employers to capture firms that may pay employees either by methods other than electronic payroll payments, or by using smaller electronic payroll services that we have not yet classified in our transaction data. While this threshold may capture some nonemployer businesses high costs of goods sold, we consider this a conservative threshold. The average small business employee in 2015 earned \$45,857, which means that \$500,000 in expenses would be more than enough to cover payroll for ten employees.
- 7 Stable micro and stable small employers tended to make modest contributions to growth, both in the top 5 percent of firms and in the full sample. To a certain extent, this follows mechanically from these segments being defined as containing firms that have stable revenue flows over time. Still, in some cities stable small employers make larger contributions to growth such as in Orlando or Phoenix. On the other hand, in some cities these firms subtract from aggregate revenue growth. The negative contributions to growth of new stable small employers are particularly high in Detroit and Portland. In any of these two scenarios, this could be the impact of an environment that is extending its positive or negative business climate to firms that are more stable, and not only to the more dynamic ones.
- 8 See Farrell and Wheat (2016) for additional details about the identification and characteristics of these 12 industries.
- 9 By way of comparison, Fairlie et al. (2016) find that 1.9 percent of firms that started as nonemployers hired their first employee one year after startup, and that 97.5 percent of firms never hire an employee in their observation window. In our sample, 2.5 percent of firms that started as nonemployers appeared as employers in their second year, and overall 86 percent never had an electronic payroll outflow. Our somewhat higher estimate of first-year transition to employment rates may be due to a small share of employers who do not use electronic payroll in their first year, but subsequently transition to electronic payroll.

Suggested Citation

Farrell, Diana and Chris Wheat. 2019. "The Small Business Sector in Urban America: Growth and Vitality in 25 Cities."
JPMorgan Chase Institute.

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