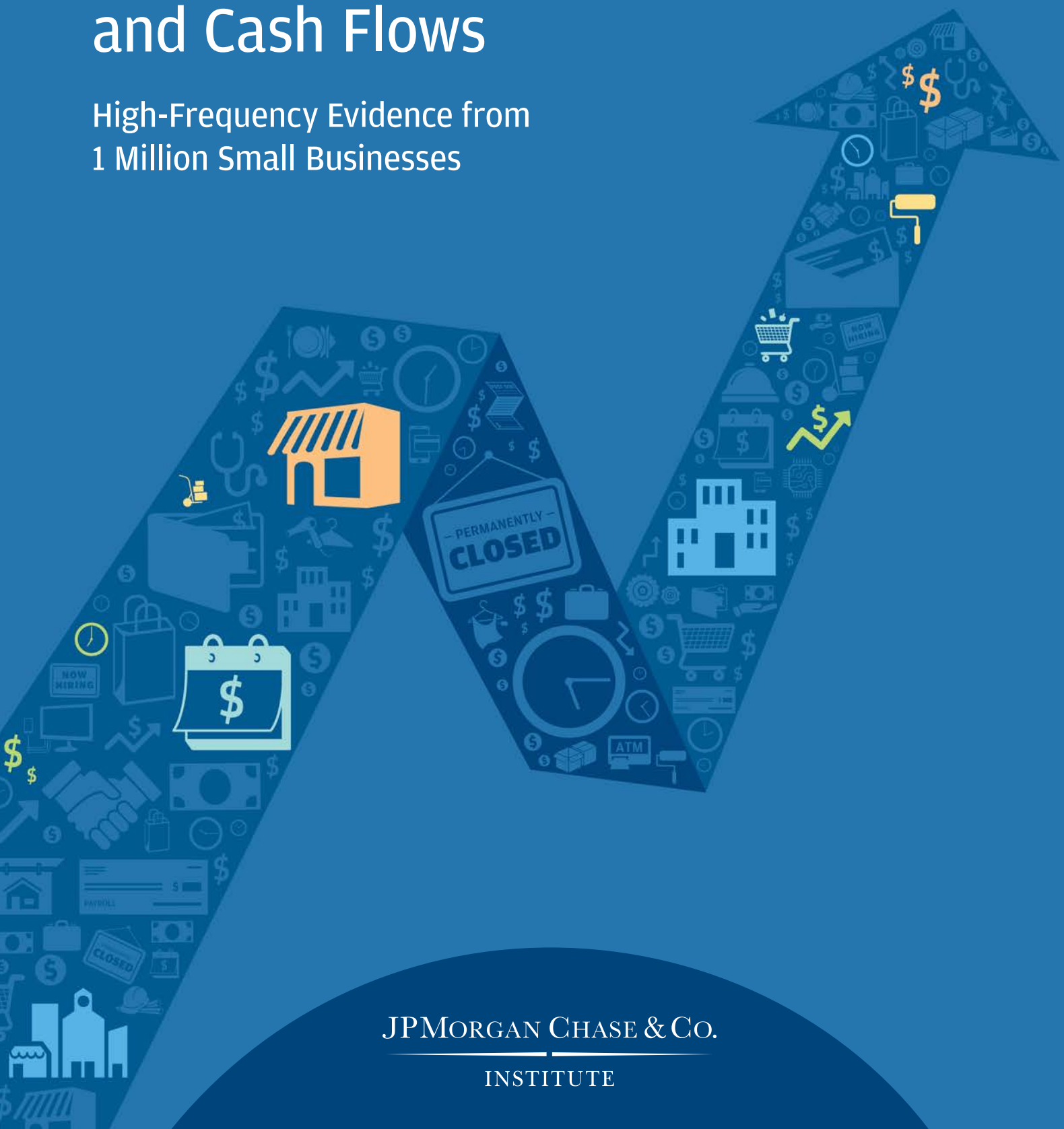
July 2018

Growth, Vitality, and Cash Flows

High-Frequency Evidence from 1 Million Small Businesses



JPMorgan Chase & Co.
Institute

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The global economy has never been more complex, more interconnected, or faster moving. Yet economists, businesses, nonprofit leaders, and policy makers 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.

The JPMorgan Chase Institute is harnessing the scale and scope of one of the world's leading firms to explain the global economy as it truly exists. Its mission is to help decision-makers—policy makers, businesses, and nonprofit leaders—appreciate the scale, granularity, diversity, and interconnectedness of the global economic system and use better facts, timely data, and thoughtful analysis to make smarter decisions to advance global prosperity. Drawing on JPMorgan Chase's unique proprietary data, expertise, and market access, the Institute develops analyses and insights on the inner workings of the global economy, frames critical problems, and convenes stakeholders and leading thinkers.

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

Acknowledgments

We thank our research team, specifically Carlos Grandet, Beatriz Rache, Olivia Kim, and Andreas Weber, for their hard work and contributions to this research.

We are also grateful for the invaluable inputs of academic and policy experts, including Bob Litan and Ian Hathaway from the Brookings Institution, Brad McConnell and Lauren Rosenbaum from Accion, Paula Pineda and Will Norwood from the City of Houston, and Joyce Klein from the Aspen Institute. We are deeply grateful for their generosity of time, insight, and support.

This effort would not have been possible without the critical support of our partners from the JPMorgan Chase Consumer & Community Bank and Corporate Data & Analytics Solutions teams of data experts, including Samuel Assefa, Connie Chen, Gaby Marano, Ram Mohanraj, Stella Ng, Rob Rappa, AShwin Sangtani, Michael Harasimowicz, Anmol Karnad, and Bill Bowlsbey, and JPMorgan Chase Institute team members including James Duguid, Alyssa Flaschner, Fiona Greig, Courtney Hacker, Amar Hamoudi, Bryan Kim, Caitlin Legacki, Jolie Spiegelman, and Gena Stern.

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

For more information about the JPMorgan Chase Institute or this report, please see our website www.jpmorganchaseinstitute.com or e-mail institute@jpmchase.com.

Growth, Vitality, and Cash Flows:

High-Frequency Evidence from 1 Million Small Businesses

Diana Farrell
Chris Wheat
Chi Mac

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Executive Summary

The small business sector, comprised of businesses with fewer than 500 employees, is an important contributor to overall US economic growth. However, the heterogeneity of the sector can obfuscate the ways in which it actually does or does not contribute to economic growth, making it difficult to develop targeted policies to support these contributions.

In this report, the JPMorgan Chase Institute introduces a newly augmented small business data asset to empirically address questions of small business growth, vitality, and economic contribution. We built a sample of 1.3 million de-identified small businesses with Chase Business Banking accounts active between October 2012 and February 2018. The over 3.1 billion transactions we analyze from these businesses provide a novel view of daily revenues, expenses, and financing cash flows for individual small businesses. We use this data asset to develop a revised segmentation of the small business sector, and a new typology of cash flow patterns. These frameworks allow us to inform the contributions of different kinds of small businesses to the US economy, as well as offer new insights about the importance of cash flow management to small business outcomes.

Data

We constructed a sample of 1.3 million firms who hold Chase Business Banking deposit accounts and meet our criteria for small operating businesses in core metropolitan areas. We then used over 3.1 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.

Full Sample

1.3 MILLION
SMALL BUSINESSES

Hold a Chase Business Banking account at any point 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
- Operate in one of the 12 industries that are characteristic of the small business sector
- Operate in one of 386 metropolitan areas where Chase has a representative footprint
- 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

We also constructed a cohort of firms which opened their business banking accounts in 2013. Firm cash flow patterns and behavior can vary as they mature, and this longitudinal sample controls for age by comparing firms of similar age.

2013 Founding Longitudinal Sample

138,000
SMALL BUSINESSES

Satisfy all "full sample" criteria, and additionally:

Opened a Chase Business Banking account in 2013:

- Opening a dedicated business account is an important milestone, and we used this event to determine firm age

Source: JPMorgan Chase Institute

Part I: The Stability and Dynamics of Small Business Segments

We propose a refined segmentation of the small business sector based on size, complexity, and dynamism, and use this segmentation to identify the contributions of different small business segments to the US economy.

Source: JPMorgan Chase Institute

Financed Growth

A very small financed growth segment of small businesses attempt to reach a scale-based competitive advantage

- Intended growth through substantial use of external finance to support asset investments
- May either grow or decline
- Have the potential to make sizable contributions to the overall economy, even though many fail

Organic Growth

There is an interesting and less understood organic growth segment

- Intended growth through limited use of external finance
- May either grow or decline
- May include a large share of businesses that transition between employer and nonemployer status

Stable Small Employer

Many small businesses are stable small employers

- Most employ 5-20 employees, though some may employ many more
- Are likely to use electronic payroll

Stable Micro

The second largest number of businesses are stable micro businesses

- Typically have no or very few employees
- Provide economic support to large numbers of households of small business owners

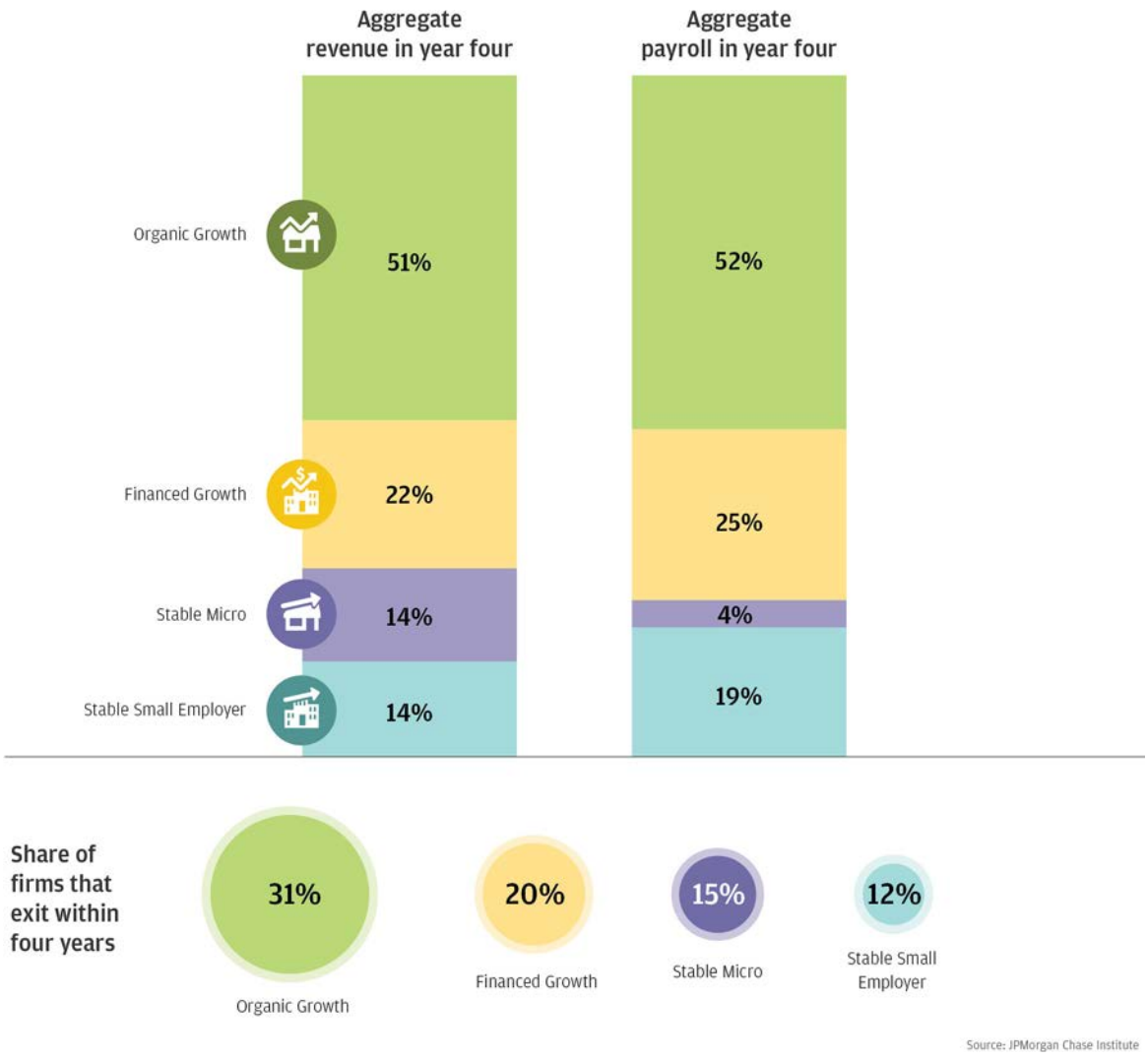
Finding One

Organic growth businesses in aggregate generate the majority of small business revenue and payroll, but are also individually the most likely to exit.

Small businesses are dynamic: Six out of 10 small businesses are organic or financed growth firms.

Dynamic small businesses take big risks: 31 percent of organic growth and 20 percent of financed growth firms do not survive four years.

Financing is not the only way to grow: More than half of small businesses are organic growth firms, and they generate the majority of revenue and payroll in the small business sector.

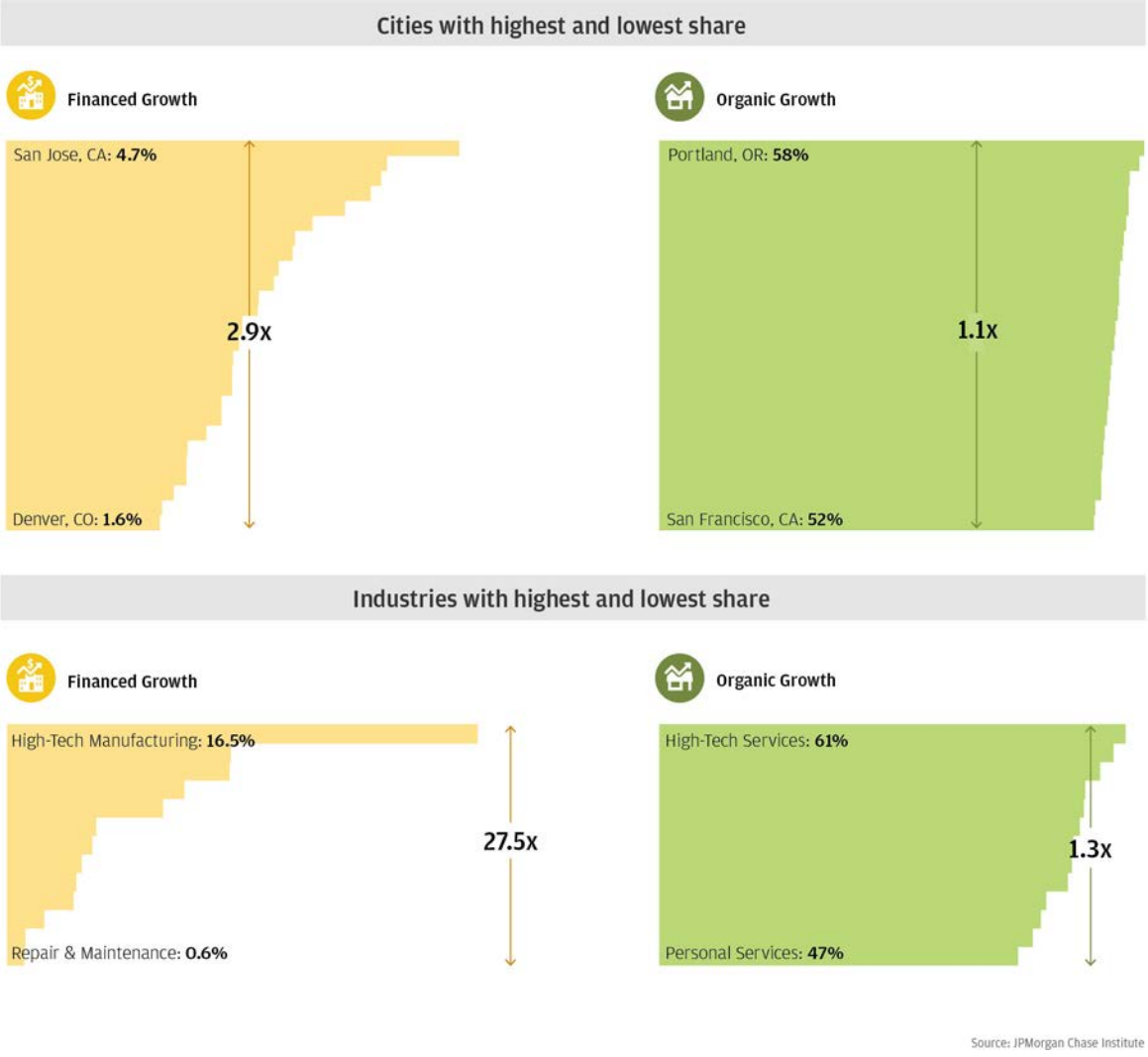


Finding Two

Financed growth firms may be concentrated in some industries and cities, but organic growth firms abound in every industry and city.

Cities with the highest concentration of financed growth small businesses had twice the incidence of financed growth firms, compared to cities with the lowest concentration, but all cities have large shares of organic growth firms.

Small businesses in high-tech manufacturing are significantly more likely to be financed growth firms, but all industries have sizable shares of organic growth firms.

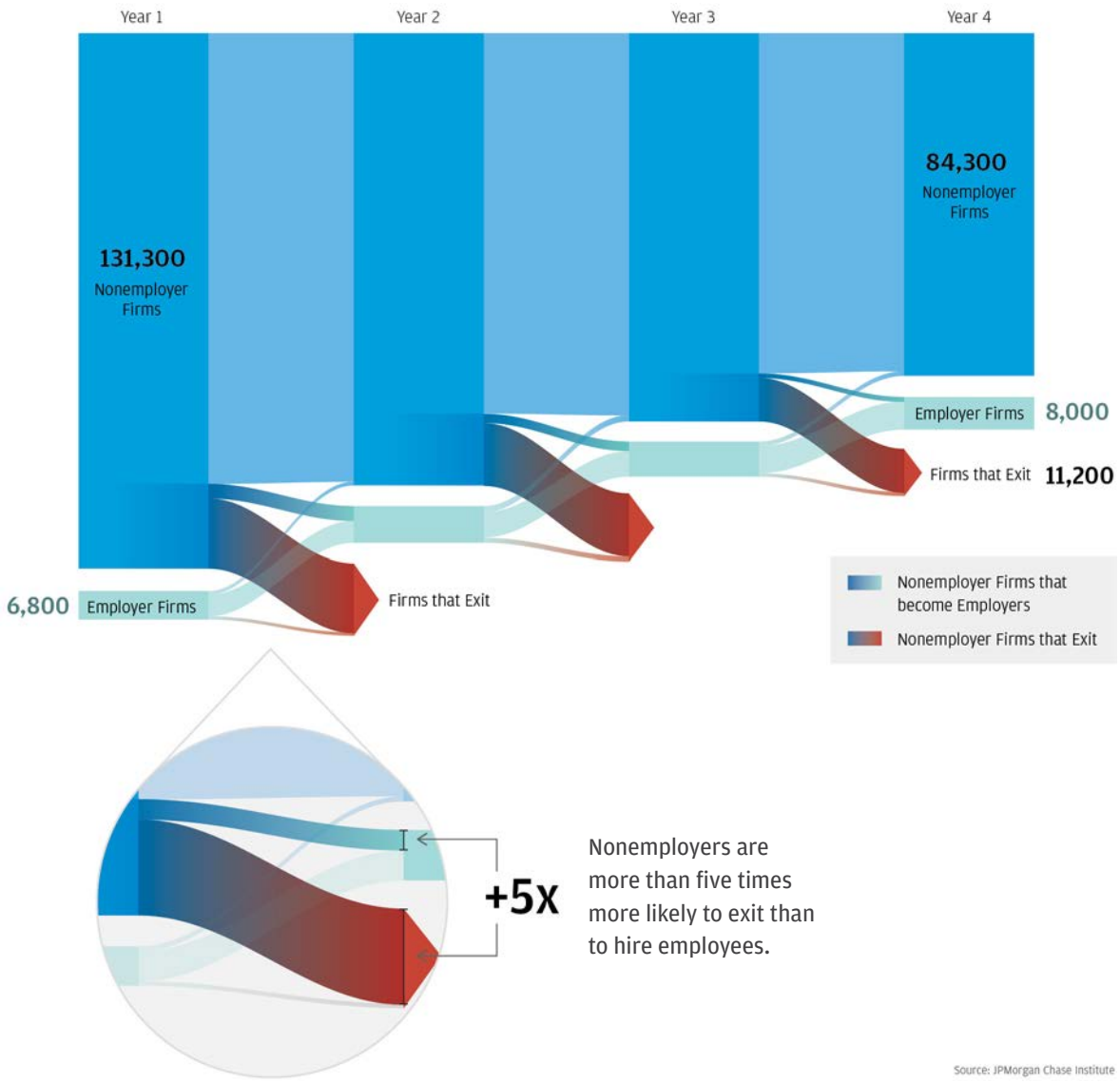


Finding Three

Nonemployer small businesses are more likely to exit than to hire employees.

We tracked employer status during the first four years of operations for our cohort of 138,000 firms founded in 2013, 5 percent of which were employers in their first year.

Each year, a small percentage of nonemployers become employers, and that likelihood only decreases as firms mature.



Part II: Cash Flow Patterns and Small Business Performance

We identify seven cash flow patterns that represent different cash flow management problems, and then use these patterns to explore the relationship between cash flow management and small business performance.

Individual firms may experience different cash flow patterns at different stages of their lifecycles. Moreover, some cash flow patterns are more prevalent in some segments.

More Regular Patterns

While few small businesses have very regular cash flow patterns, some patterns are more regular than others.

1 Regular weekly

Larger revenues and expenses occur with weekly frequency, with little deviation in amount or timing.

2 Regular weekly + Financing

Very similar to cluster 1, only with high utilization of financing.

3 Semimonthly revenues

Larger revenues occur about twice a month, while expenses are paid about weekly.

4 Semimonthly revenues + Financing

Very similar to cluster 3, only with high utilization of financing.

Less Regular Patterns

There are qualitative differences among cash flow patterns for those small businesses with less regular cash flows.

5 Erratic timing

Although the cash flow amounts do not show particular volatility, their timing is very inconsistent.

6 Volatile expenses

Expenses are more volatile than revenues, while the reverse is true for most other firms.

7 Sporadic revenues

Revenues are particularly infrequent, about once every 7 weeks, and the amount varies greatly. Financing is heavily utilized.

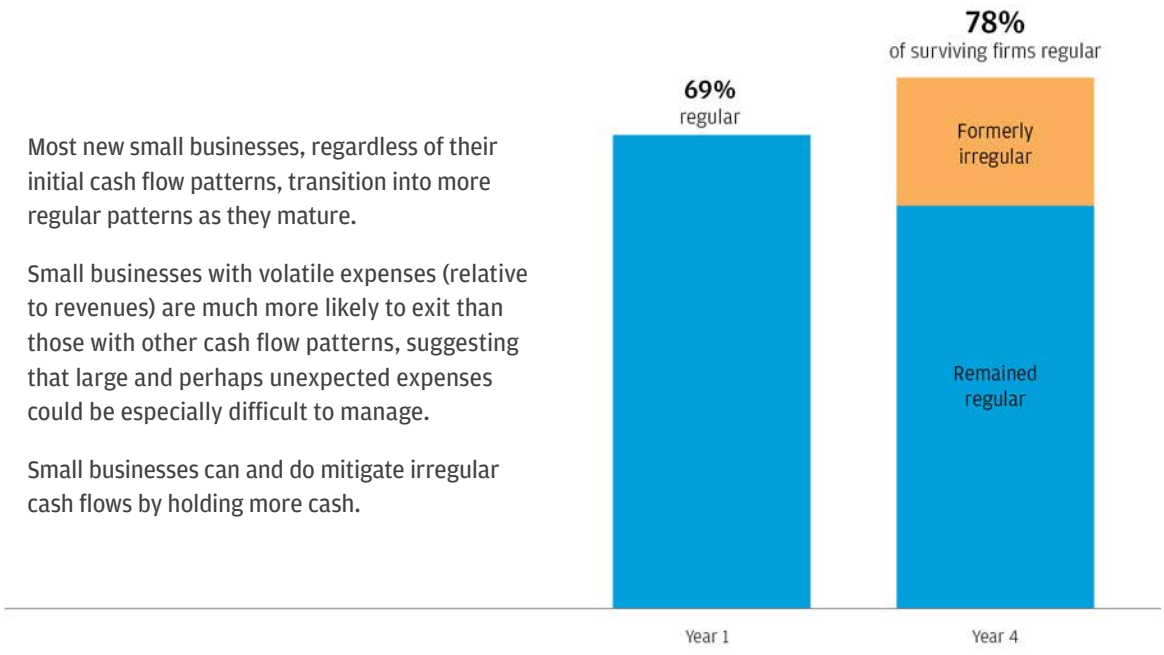
Finding Four

New small businesses achieve more stable and regular cash flow patterns over time, or exit.

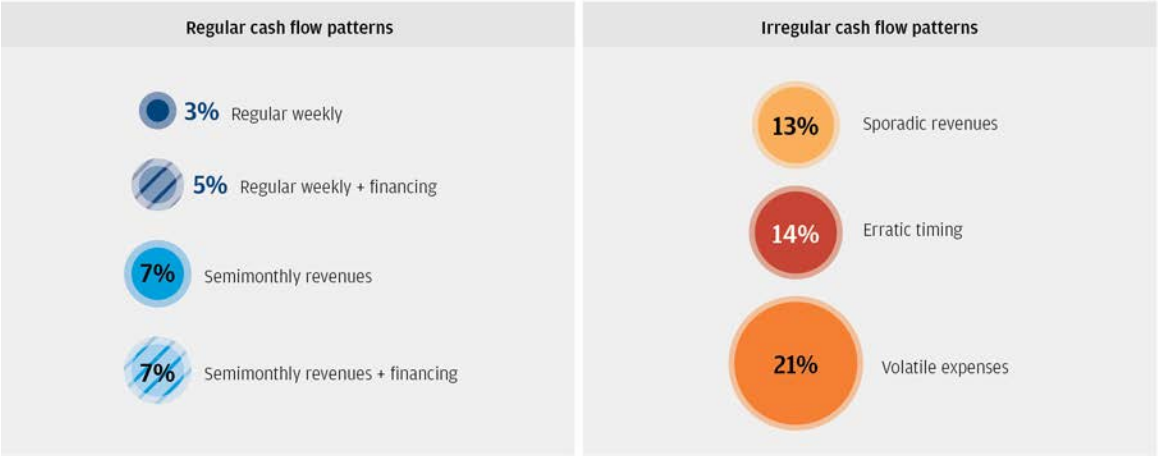
Most new small businesses, regardless of their initial cash flow patterns, transition into more regular patterns as they mature.

Small businesses with volatile expenses (relative to revenues) are much more likely to exit than those with other cash flow patterns, suggesting that large and perhaps unexpected expenses could be especially difficult to manage.

Small businesses can and do mitigate irregular cash flows by holding more cash.



Share of firms exiting in year 4 by cash flow pattern in year 3



Source: JPMorgan Chase Institute

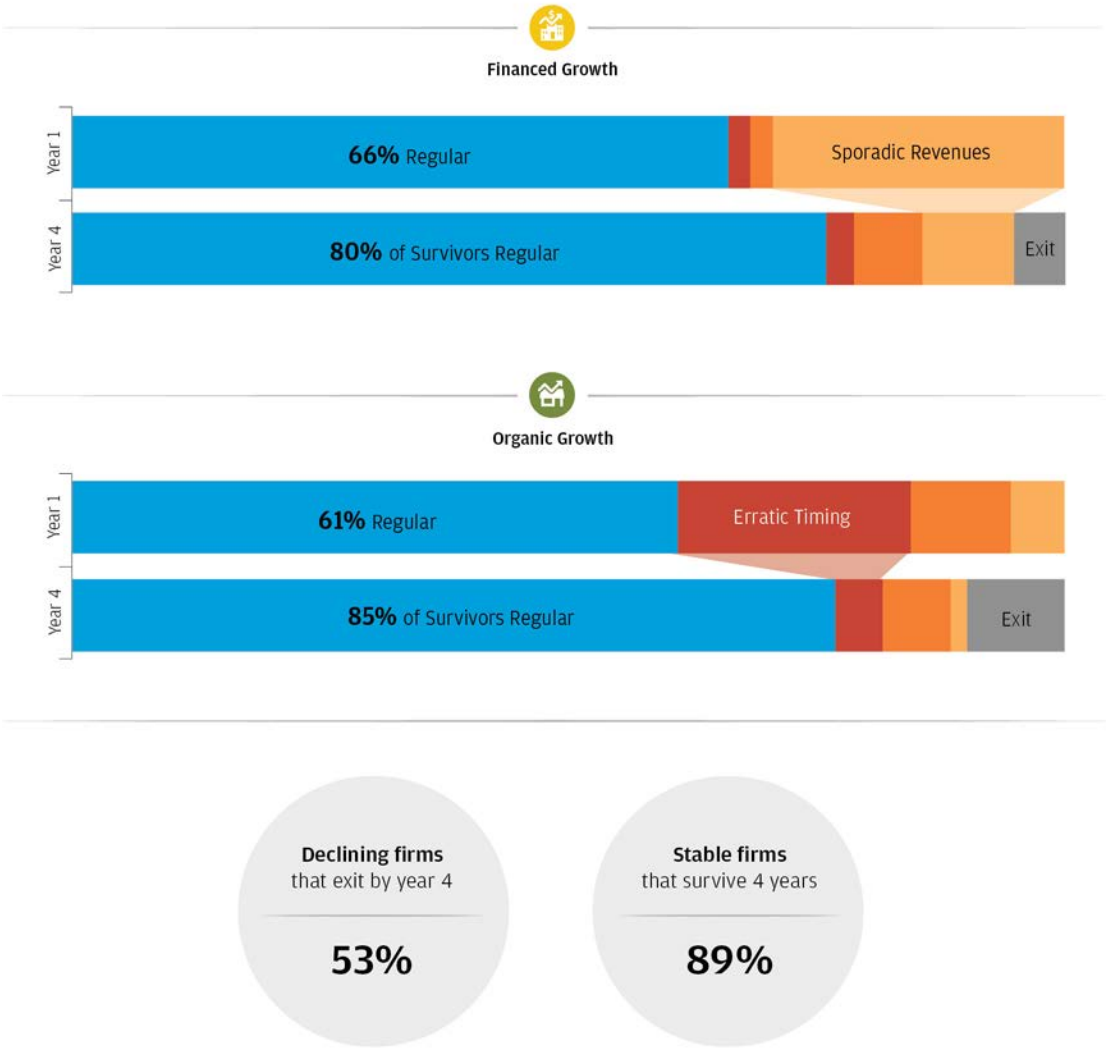
Finding Five

Growing dynamic firms transition from irregular cash flow patterns in different ways, stable firms survive, and dynamic firms that fail to grow exit.

Every small business segment has firms with each of the seven cash flow patterns, but some patterns are more prevalent in some segments, especially as firms mature.

New dynamic small businesses are particularly prone to certain types of irregularity: Financed growth firms are particularly likely to have sporadic revenues, and organic growth firms are especially likely to experience erratic timing of both revenues and expenses. These types of irregularity become less common for firms that grow.

Cash Flow Patterns of Growing Dynamic Firms



Source: JPMorgan Chase Institute

Conclusion

In this report, we brought new data to two conversations about the economic contributions of the small business sector—a first concerning the large contributions of a potentially small set of high-growth businesses, and a second concerning the contributions of the majority of small businesses to widespread and diverse economic growth. We use these data to offer two new frameworks in which to consider these questions—a revised segmentation of the small business sector, and a new typology of cash flow patterns.

Our findings highlight the existence and economic importance of a large segment of dynamic small businesses that grow organically without heavy reliance on external financing. In aggregate, these small businesses generate substantial shares of both revenue and payroll, and importantly, are widely distributed across regions and industries. While the nonemployer small businesses that make up the majority of the sector are unlikely to transition to employer status, many are nevertheless important when viewed through other lenses of economic growth.

Our findings also offer a first high-frequency view of the cash flow dynamics of small businesses. Across the board, small businesses have volatile, irregular, and potentially unpredictable cash flows. Many small businesses transition to more regular cash flows as they age, though many that fail to do so exit. Notably, the kinds of cash flow issues that small business navigate vary meaningfully by segment—financed growth firms were particularly likely to face and resolve cash flow problems related to the uncertainties around revenue, while organic growth firms were more likely to experience a broader array of unexpected cash flow timing.

These findings suggest that policy makers interested in economic growth have an opportunity to focus on a wider range of small businesses than the financing-intensive high growth firms that often are the focus of small business policy, and that opportunities for productive action may exist across a wider variety of regions and industries than previously thought. While the irregularity of cash flow we observe across segments warrants a continued focus on ensuring that small businesses have sufficient liquidity to grow, our findings suggest that programs that help small businesses better manage their cash flows may be equally, if not more, impactful in supporting the overall growth of the US economy.

Introduction

The small business sector, comprised of businesses with fewer than 500 employees, is often prized for its potential contributions to the growth and health of the US economy. While there is general agreement that the sector is important to economic growth, there are two distinct narratives about how small businesses actually contribute.

A first narrative focuses on a subset of small businesses that make outsize contributions to the overall economy. A prominent thread of this narrative emphasizes the large contributions of small businesses to net job creation, particularly when they are young (Haltiwanger et al., 2013; Wiens and Jackson, 2015), and especially in their first year (Farrell and Wheat, 2017b). Moreover, the majority of jobs are created by a relatively small number of fast-growing firms (Birch and Medoff, 1994; Audretsch, 2012). In addition, net job creation contributes to macroeconomic growth through business dynamism—the broader process by which innovation drives growth and productivity gains by reallocating resources from exiting failing firms to new more productive firms (Decker et al. 2014, 2016; Hathaway and Litan, 2014; Economic Innovation Group, 2017). As key sources of both gross job creation and destruction, this same subset of small businesses may also drive dynamism and longer term economic growth.

While the overwhelming majority of small businesses only provide jobs for their owners, many are the economic support for the households of these owners.

A second narrative concerns the ability of the small business sector to deliver economic gains to broad and diverse segments of the US economy, with a particular focus on the majority of the over 30 million small businesses in the United States, 24 million of which have no employees, and most of which will never grow large enough to attract large amounts of external financing. While the overwhelming majority of these businesses only provide jobs for their owners, many nevertheless are the economic support for the households of these owners. The large number of these very small businesses implies that their aggregate performance can affect the financial well-being of a meaningful fraction of US households. Notably, while high-growth firms may have limited impact on diverse households (Finney and Rencher, 2016), the smallest small businesses are much more likely to be owned by women and minorities.[1]

These two narratives highlight the heterogeneity of the small business sector. Several observers have proposed segmentations of the sector that identify the distinctive contributions of different small business segments to the economy (Birch and Medoff, 1994; Mills, 2015; Farrell and Wheat, 2017a). These segments may differ substantively from one another in ways that are both persistent over time (Pugsley, 2018) and identifiable from early firm behaviors (Davis et al., 2009). In particular, these segmentations often differentiate the high-growth firms that are central to the first narrative from the larger universe of small businesses that are central to the second.

Across the heterogeneity, liquidity and the management of cash flows is a core issue to businesses seeking to grow as well as those simply seeking to survive. While differences may persist across segments in terms of the likelihood of seeking and attaining credit,[2] the majority of small businesses work with a sufficiently small cash buffer (Farrell and Wheat, 2016), suggesting that their ability to manage cash is important. Small businesses with the potential to grow large enough to individually impact the aggregate economy often do so by using external finance to cover operational cash flow shortfalls until demand grows for their new product or service. Likewise, a smaller business that may only grow enough to impact the financial well-being of its

owner or a few employees needs to hold sufficient liquidity to withstand small shocks during its formative years that might otherwise cause the business to fail. In this sense, a better lens on the management of cash flows is key to understanding the growth and survival prospects of many if not all types of small businesses. Accordingly, the absence of data that directly inform the cash flow outcomes of US small businesses limits the ability of policy makers to fully understand the relationship between liquidity, growth and vitality.

This report seeks to fill these gaps by introducing a newly expanded data asset based on de-identified financial data from 1.3 million small businesses that use Chase Business Banking deposit products between October 2012 and February 2018. This data asset offers several novel features. First, it is comprised of over 3.1 billion de-identified transactions, offering a view of individual firm financial behavior with unprecedented granularity. This transaction-level data allows us to determine revenues, expenses, and financial inflows and outflows at a daily level for each individual small business. Second, transaction-level data allow us to observe specific payments (notably, electronic payroll payments) to identify other key firm characteristics as they vary over time. Third, as a longitudinal administrative data set, this data asset allows us to observe the lifecycle of a cohort of individual small businesses from the time they open their first account to the time they close their last. This provides us with a large sample of businesses for which we observe their founding and formative months and years—a critically important time for understanding the contributions of the small business sector to economic growth (Davis et al., 2008; Haltiwanger et al., 2017). We use this newly augmented data asset to develop key findings in two parts:

Our first set of findings sheds light on the heterogeneity of the small business sector by proposing a refined segmentation, offering new insights about the economic contributions of each segment across the US economy and in local markets, and characterizing the relative stability of small businesses in each segment. This segmentation confirms the outsize economic contributions of businesses that are most likely to achieve high growth through investments in scalable assets. In addition, we also identify a distinct segment of smaller dynamic firms—a segment of largely nonemployer businesses that grow organically rather than through external finance. These organic growth small businesses not only generate the majority of revenue among firms in their first four years, but they also abound across industries and local economies. Notably, we find evidence that these segments may be quite rigid—we find that nonemployer businesses are substantially more likely to exit than they are to hire an employee and transition to employer status.

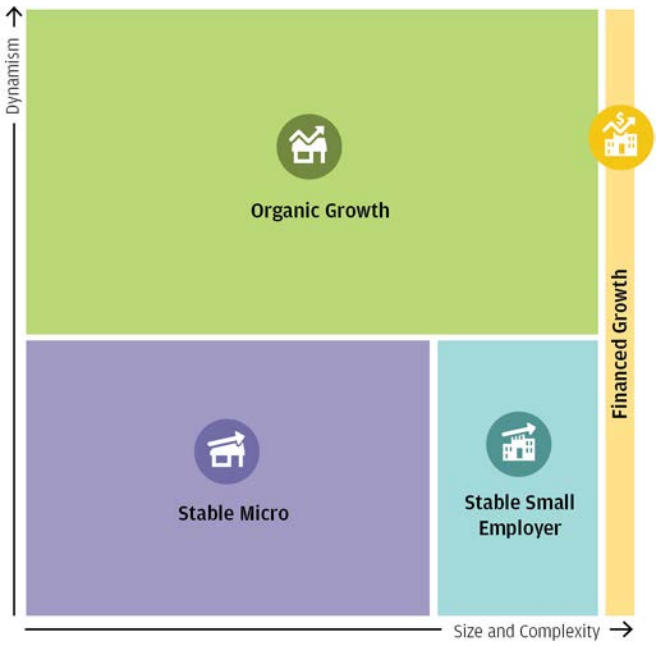
Our second set of findings leverages a first-ever lens on high-frequency cash flows that is truly unique to our new data asset. We perform a cluster analysis to develop a novel typology of cash flow patterns that sheds light on the way small businesses actually manage their cash flows. This typology allows us to assess the challenges of cash flow management for individual firms over time. Armed with this powerful lens, we find that most small businesses either transition from less regular cash flow patterns to more regular cash flow patterns over time, or exit if they fail to do so. When applied across our proposed small business segments, this typology not only corroborates the dynamism and stability the segmentation seeks to distinguish, but also offers fresh insights about the relationship between cash flow management, survival and growth within segments. Specifically we find that both financed growth and organic growth firms tend to have unique patterns of irregular cash flow in their early years, but that those with increasing revenues transition to more stable patterns. Most stable micro and stable employer firms have relatively regular cash flow patterns, and most survive the first few years. In contrast, a majority of dynamic firms with declining revenues exit within four years.

Part I: The Stability and Dynamics of Small Business Segments

Heterogeneity across the sector makes it difficult to discern the impact of different kinds of small businesses. By counts of businesses, most US businesses are small—80 percent of all US businesses have no employees at all in 2015, and over 99 percent of firms with employees had fewer than 500 employees.[3] However, by some estimates, the nonemployer businesses that reflect the majority of small businesses in the US produced less than five percent of total business revenue in recent years (Shane, 2012).[4] As such, growth and vitality may have very different meanings for a storefront operated by a sole proprietor than they do for a technology-intensive startup with venture capital finance from Sand Hill Road, or for any small business that falls somewhere in between.

In prior work, we reviewed small business research to develop a segmentation of the small business sector that first differentiated nonemployers, employers, and high-growth firms, and then differentiated among these groups based on the age of the firm (Farrell and Wheat, 2017a). Here, we seek to refine this segmentation, with a particular interest in improving our lens on policy-relevant distinctions among firms in their first few years of operation.[5] Specifically, we continue to treat growth potential and employment status as first order distinctions, but widen our lens on growth potential to distinguish between the small segment of financed growth firms that leverage external capital to grow and the 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. Figure 1 summarizes this revised segmentation.

Figure 1: A revised segmentation of the small business sector



Source: JPMorgan Chase Institute

Financed Growth

Our first segment consists of small businesses that have the potential for high growth at scale. We intend this segment to contain firms that prior researchers have identified as high-growth firms (Audrestch, 2012) or "gazelles" (Birch and Medoff, 1994). These prior definitions typically require a firm to meet some initial size threshold, such as having ten or more employees in their first year (Audrestch, 2012) or revenues over $100,000 (Birch and Medoff, 1994). In addition, these firms must grow at a high rate for some number of years, typically at least 20 percent year-over-year growth for 3 years or more.

Rather than focus on observed growth, our definition focuses on behaviors that correspond to the intention to grow (Guzman and Stern, 2016). To this end, we focus on firms that engage in financial behaviors consistent with the intent 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.[6]

Organic Growth

Our second segment consists of small businesses that are not in the financed growth segment, but have revenues that either grow or decline substantially. Conceptually, we seek to capture firms with growth intentions, but primarily attain that growth organically out of operating profits rather than through the use of external financing. As with our financed growth segment, we seek to capture the universe of firms that had the potential to grow rather than only those that in fact grew.

While our data asset does not provide a direct line of sight into growth intentions or the organic reinvestment of profits into growth, we can leverage *post hoc* observations of revenue growth. In order to capture both firms that intend to grow and succeed and those that intend to grow but fail, we 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.

Box 1: Financed Growth

For Friends Burgers
Big Metro, GA

2015 Revenue: $13,500,000

2015 Major Expenses:
Advertising

2015 Employees: 55

Founded with a single restaurant in 2013 by four friends from business school, For Friends Burgers always had ambitions to grow. Two of the founders majored in marketing (the third concentrated in finance, and the fourth had worked in his family restaurant as a teenager), and strongly believed that there was an untapped and growing market opportunity for upscale casual fare presented in retail locations close to growing high-income but younger communities.

At the end of 2013, the founding team approached MBA classmates and family and raised equity of $1 million to fund a regional advertising campaign ahead of expansion.

After a successful first six months, they opened four additional locations in the Big Metro area in 2014, and then attempted regional growth across the Southeast in early 2016. For Friends Burgers went out of business by the end of 2016 after failing to manage cash flows in line with their aggressive growth plans.

Box 2: Organic Growth

Small Dollar Electric
Buildington, OH

2015 Revenue: $240,000

2015 Major Expenses:
Rent, payroll

2015 Employees: 1

Mary Williams spent 10 years working for a large public utility before spending five years as a store manager for a parts supply retailer. After noticing an uptick in customers after a developer broke ground on a local office park, Mary left her job in 2013 to start Small Dollar Electric, an electrical installations contracting firm.

By 2015 Small Dollar Electric had successfully completed several contracts for private sector clients. For larger projects, Mary partnered with other contracting firms rather than hiring full-time tradesmen. However, in order to help manage increasing demand and better track her business accounts, Mary did hire a full-time office and business manager.

Stable Small Employer

Our third segment is drawn from the universe of less dynamic small businesses—businesses that are in neither the financed growth nor organic growth segments. Within this universe, 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.[7] These small businesses likely have a stable growth strategy and a business model premised on the employment of others.

Stable Micro

Our fourth segment is also drawn from the universe of less dynamic small businesses. Within this universe, we define the stable micro as 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. These firms likely have no or very few employees.

In order to add color and context to these segments, Boxes 1-4 present accounts of four fictional small businesses in each of these sectors.

Box 3: Stable Small Employer

Suburban Dermatology
Suburban, MI

2015 Revenue: $1,500,000

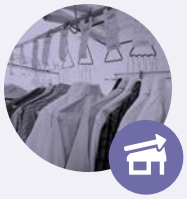
2015 Major Expenses: Payroll, rent, medical equipment leases

2015 Employees: 7

After working as staff dermatologist at County General Hospital (a large public hospital) for seven years, Dr. Wendy Xi branched out on her own to found Suburban Dermatology as a solo practitioner in 2013. Dr. Xi had long thought of opening her own practice in order to be closer to home, and have greater control over her schedule. She hired three medical assistants, an office manager, and a receptionist, all of whom she had worked with previously at County General.

After solidifying her patient base in 2015, Dr. Xi hired a physician assistant to work with her in the practice and provide greater flexibility for scheduling. She also hired an accountant/finance specialist to help with medical billing. She was approached by several private equity firms who sought to acquire her practice and assist with its growth, but declined these offers, stating an interest in maintaining the culture of her small practice.

Box 4: Stable Micro



Everyday Dry Cleaners
Commutertown, CT

2015 Revenue: $105,000

2015 Major Expenses: Rent, electricity and gas (utilities)

2015 Employees: None

Janine and Harold Kostner founded Everyday Dry Cleaners in 2013. Mr. and Mrs. Kostner opened their dry cleaners a few blocks from their local commuter train station in a small cluster of retail storefronts in an otherwise residential neighborhood.

Janine and Harold work in their dry cleaners six days a week, nearly every day of the year. During some summers and holidays, Janine's sister has also worked at the dry cleaner on an occasional basis. While they have worked hard to build a strong business, they do not plan to do any formal external hiring or open any new locations in the foreseeable future.

Everyday Dry Cleaners achieved modest revenue growth over the past few years, but mostly provides income for the Kostner household. In 2016, Janine and Harold joined the Commutertown chapter of National Association of the Self-Employed.

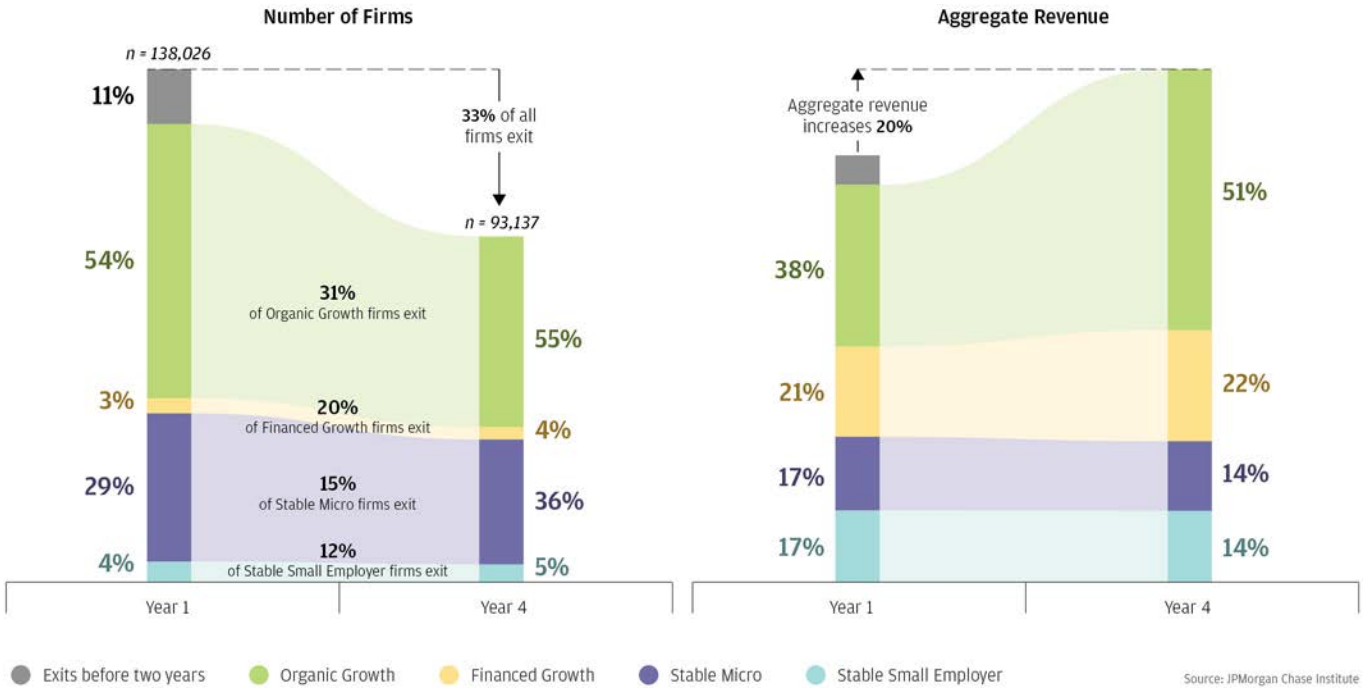
Findings

Finding One

Organic growth businesses in aggregate generate the majority of small business revenue and payroll, but are also individually the most likely to exit.

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. Figure 2 shows the total share of firms and the aggregate revenue produced by firms in this cohort during the first and fourth years for each of our four segments.

Figure 2: Organic growth firms contribute the majority of small business revenue four years after founding



Among one-year-old firms, organic growth firms are the most common type of firm at 54 percent, and at 38 percent these firms also generate the largest share of revenue. Financed growth firms are the smallest share of firms by count at only 3 percent, but generate a disproportionately large 21 percent of revenue. Stable micro businesses are the second largest share of one-year-old businesses at 29 percent and generate a relatively large share of revenue at 17 percent. In our sample one-year-old stable small employer firms only account for 17 percent of aggregate revenue.

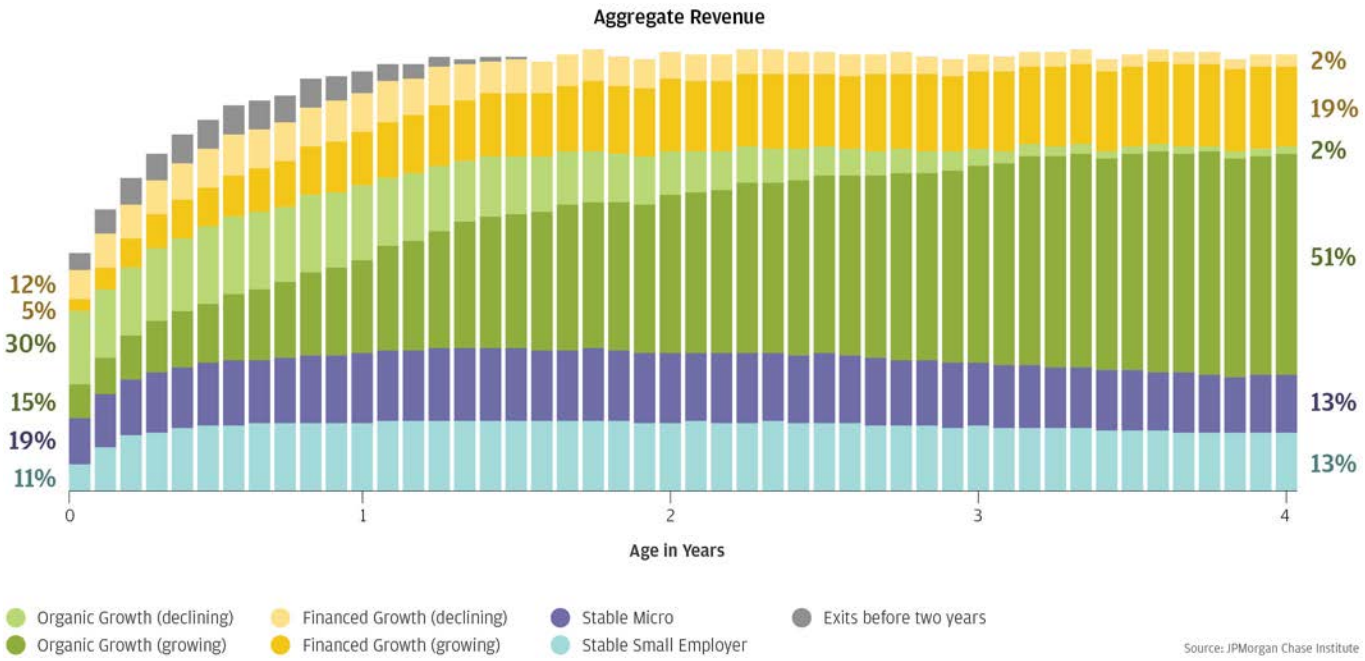
Figure 2 also illustrates changes in revenue share by each small business segment from the first year to the fourth year. Most notable is the growth in revenue contribution by financed growth firms. After four years, the share of revenue generated by these firms grows slightly from 21 to 22 percent, suggesting that the gains from firms with increasing revenues are almost entirely offset by firms with

declining revenues and those that exit. In contrast, the share of revenue generated by organic growth firms increases 13 percentage points from 38 to 51 percent. As a result, these firms generate the majority revenue after four years. Stable small employers see a decline in revenue share from 17 to 14 percent, even though their share of firms rises from four to five percent. The revenue share of the stable micro segment declines three percentage points from 17 to 14 percent.

While firms in the organic growth segment play a central role in aggregate revenue generation, they are also the most fragile. Figure 2 notes that over 31 percent of organic growth small businesses that survive for one year exit before the end of their fourth year. This exit rate stands in sharp contrast to the 12 percent of stable small employer firms that exit over the same time frame, or even the 20 percent exit rate among small businesses in the financed growth segment.

At first glance, the revenue shares of each segment shown in Figure 2 appear relatively stable from the first year to the fourth. However, a key dynamic in aggregate revenue growth is the combination of revenue gains from growing firms and revenue losses from declining firms. This dynamic is most pronounced among organic growth and financed growth firms. To explore this, we partitioned these two segments by observing which firms saw greater revenue growth and which ones saw declines after the fact. Figure 3 presents a month by month view of aggregate revenue growth of the cohort with this distinction identified.

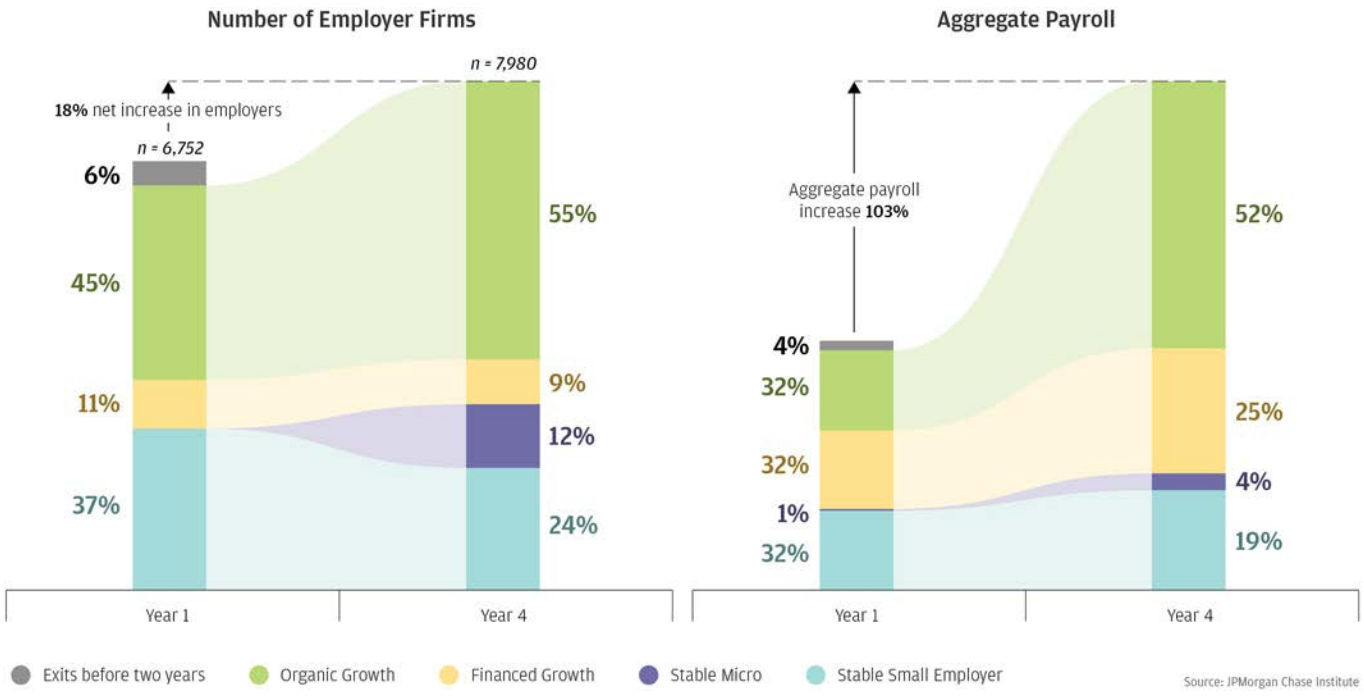
Figure 3: Growing organic growth firms generate more aggregate revenue than growing financed growth firms



This analysis shows the striking contributions of organic growth small businesses when they actually grow. The contribution of these firms to aggregate growth increases from a 15 percent share at birth to 51 percent four years later. While aggregate revenues from growing financed growth firms grow nearly fourfold from 5 to 19 percent, growing organic growth firms contribute a substantially larger amount to aggregate revenues.

We find similar results when we examine the contribution of firms across our segmentation to aggregate payroll payments. Figure 4 shows the share of firms in each of our segments that have electronic payroll outflows, and the share of aggregate payroll outflows for each segment among one-year-old and four-year-old firms. Notably, among one-year-old firms, 45 percent of employer firms are organic growth, the largest share of any segment. Overall, the organic growth segment is mostly comprised of nonemployer firms—only four percent of organic growth firms have electronic payroll outflows. However, the organic growth segment is sufficiently large that a small share of employer firms within the segment can comprise a plurality of employers among one-year-old firms, and a majority of employers among four-year-old firms. In combination with their potential to grow, this leads to organic growth firms' generating 52 percent of payroll payments among four-year-old small businesses—the majority of payroll for the sector.

Figure 4: Organic growth firms contribute the majority of small business payroll four years after founding



These results stand in contrast to prior research that focuses on the outsize contribution of "gazelles" identified as firms that have grown significantly after the fact. By neglecting to account for lost economic activity attributable to declining or exiting firms that may be indistinguishable from other high-growth firms at founding, these studies may overstate the impact of this specific kind of small business. In addition, our finding begins to unpack prior work that has focused on the role of the small business sector in overall business dynamism, and in particular on the large contribution of new small employers to net job creation (Haltiwanger et al., 2013; Neumark et al., 2011). First, firms in the stable micro and organic growth segments that may not have employees make substantial contributions to the economy that cannot easily be measured in terms of job creation. These contributions can also come in the form of improved products and services, or through strengthening the financial well-being of the owners of these businesses. Second, the large contributions to aggregate net job creation may be driven as much by high-growth organic growth firms that only grow to be small employers as they are by high-growth financed growth firms who eventually become large employers.

Stable micro and organic growth firms that may not have employees make substantial contributions to the economy that cannot easily be measured in terms of job creation.

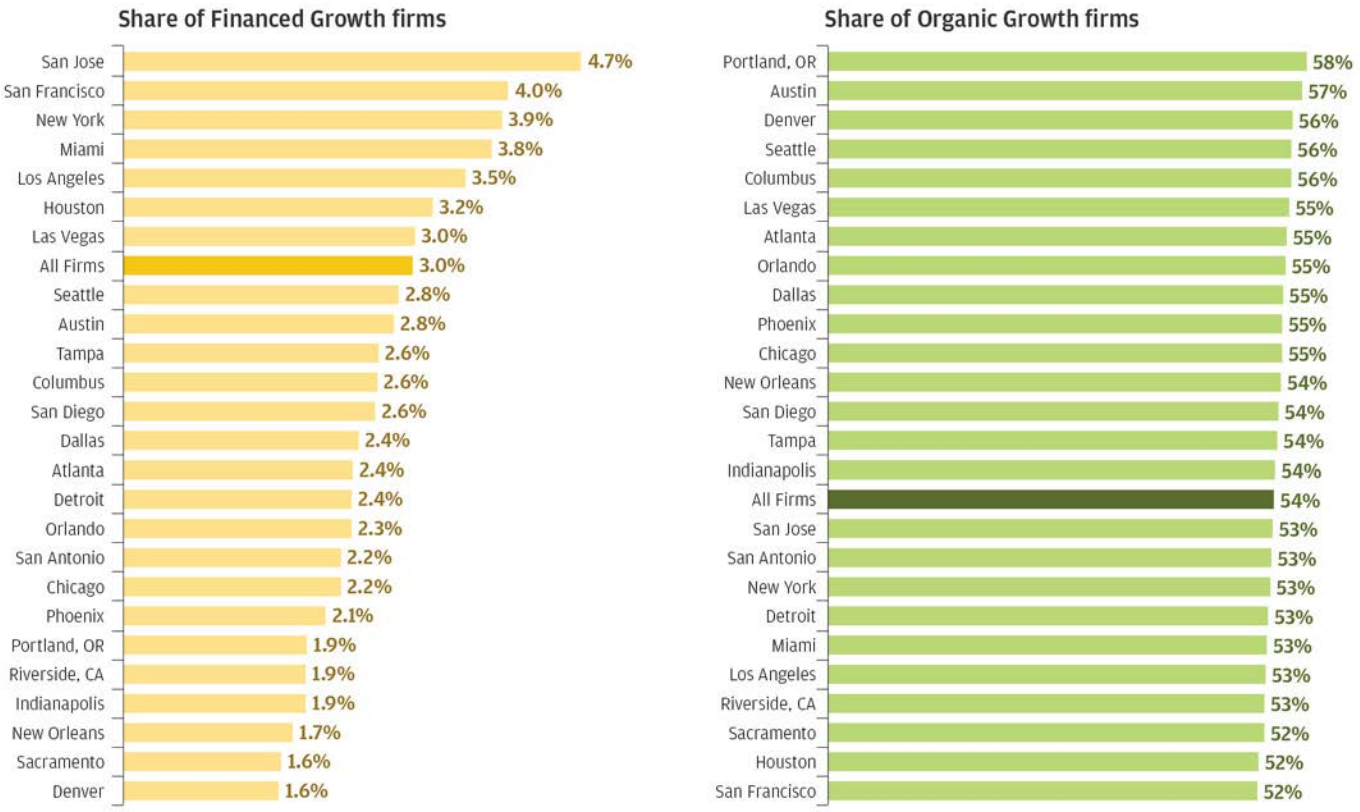
Finding Two

Financed growth firms may be concentrated in some industries and cities, but organic growth firms abound in every industry and city.

Local and federal policy makers alike have sought to better understand how to build local economies that support fast growing entrepreneurial firms. Prior research which shows that fewer than three percent of firms generate 40 percent of new jobs (Clayton et al., 2013; Haltiwanger et al., 2012) grounds this question for policy makers seeking to boost employment opportunities in their local economy, especially given observed differences in the share of high growth firms across cities (Florida and King, 2016; Hathaway, 2018). Along similar lines, much of the research on high growth firms has attempted to identify the industries that are most likely to generate significant growth of small, young and/or entrepreneurial businesses.

Finding 1 confirms that surviving financed growth firms that grow have played a disproportionate role in economic growth. It also suggests that other kinds of small businesses, particularly organic growth firms, contribute more to aggregate economic growth in their early years, and also that these firms might more broadly distribute the benefits of that growth across an economy. With this observation in mind, we next explore the distribution of firms across our segmentation by geography and industry.

Figure 5: Firms in the Bay Area and New York metro area were particularly likely to be financed growth firms, while organic growth firms were prevalent across all metro areas

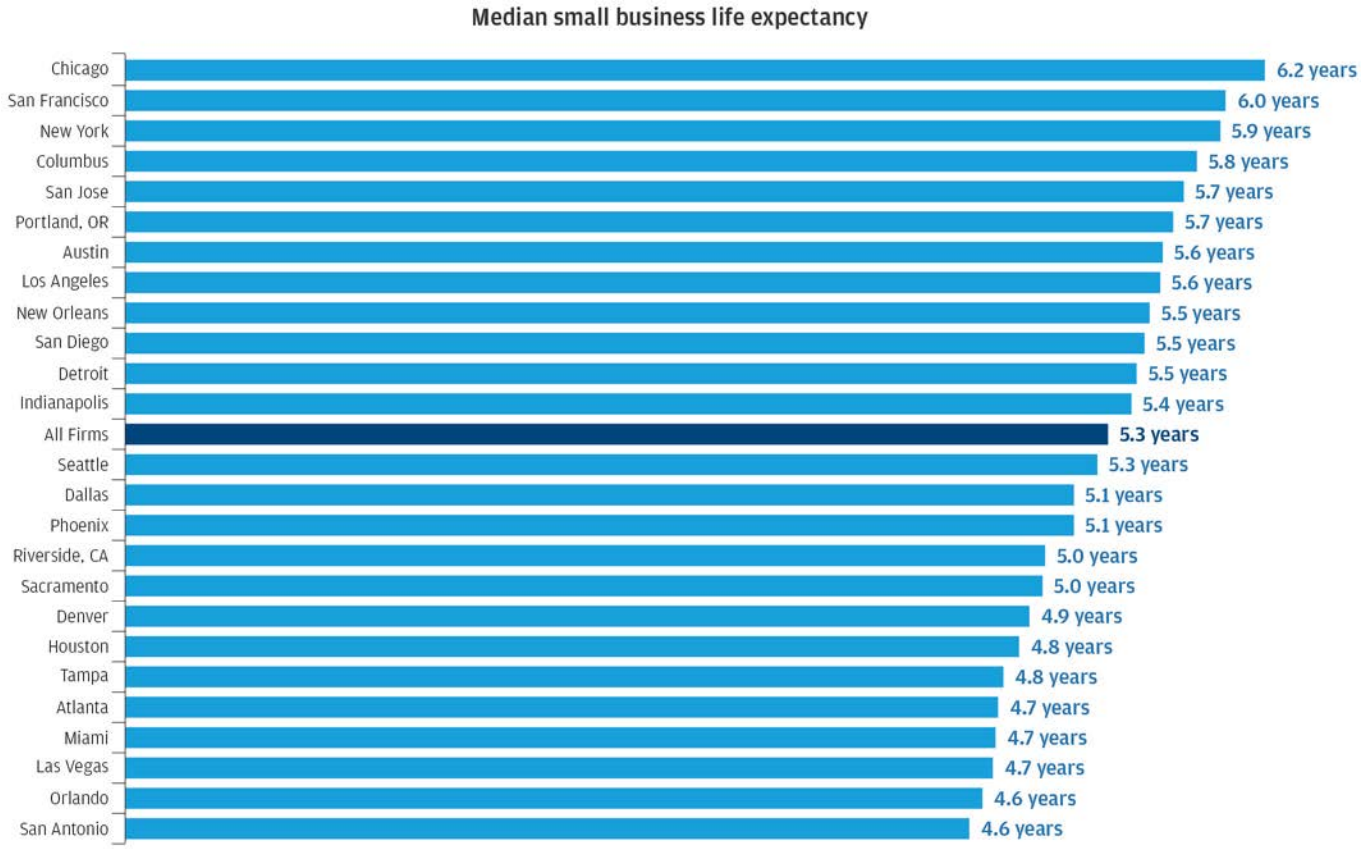


Note: The share of micro stable firms ranged from 24.7% (San Antonio metro area) to 30.6% (Chicago metro area), and the share of stable small employer firms ranged from 2.7% (Miami metro area) to 5.5% (San Jose metro area).

Source: JPMorgan Chase Institute

Figure 5 shows the share of financed growth and organic growth firms in our sample for 25 metro areas. While the share of financed growth firms is small at 3 percent across our entire sample, some metro areas had a much higher concentration of these firms than others. More than 4 percent of all small firms in the San Jose and San Francisco metro areas were in the financed growth segment, while fewer than 2 percent of firms in Portland, OR, Riverside, CA, Indianapolis, New Orleans, Sacramento and Denver met this distinction. Firms in San Jose were nearly three times as likely as those in Denver to fall into this category. Moreover, small businesses in San Jose were nearly three and half times as likely as those in New Orleans to be both in the financed growth segment and experience sustained revenue growth. In contrast, 54 percent of firms were in the organic growth segment across our sample, with similarly large shares across all 25 metro areas. At 58 percent, the Portland, OR metro area had the largest share of organic growth firms. While the San Francisco metro area had the fewest at 52 percent, this was still a majority of all firms in the area, and a level comparable to other areas we observed.

Figure 6: Median small business life expectancy varies by metro area



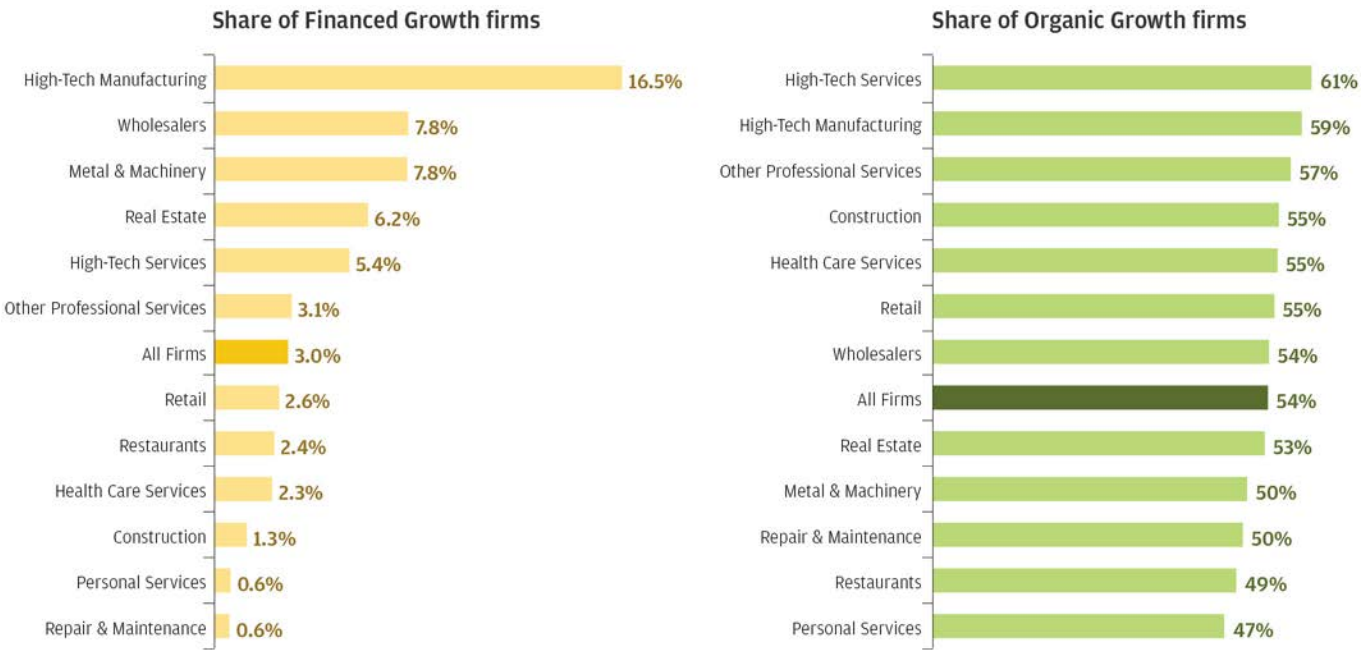
Note: We estimate median small business life expectancy by determining an annualized exit rate from Year 1 to Year 3 and assuming constant exit rates over time.

Source: JPMorgan Chase Institute

While shares of firms in growing revenue segments provide one lens on business dynamism within a regional economy, many small businesses exit within their first few years. Importantly, exits provide a mechanism for the economy to reallocate resources to successful new ventures (Davis et al., 2008). Accordingly, a view of the dynamism of a city that only focuses on growth provides a limited view. To this end, Figure 6 shows estimated median small business life expectancy in each of our 25 metro areas for firms by for each of their first three years. In our sample, small businesses in the Chicago metro area had the longest life expectancy. Half of small businesses in Chicago were likely to stay in business for 6.2 years or more before exiting. In contrast, small businesses in the San Antonio metro area had the lowest life expectancy. Half of these small businesses were likely to exit 4.6 years or fewer after founding.

The differences we observe across metro areas in terms of growing financed growth firms are largely in line with other research that has drawn attention to fast growing firms in these areas. However, our analyses also draw attention to the broader dynamism of the small business sector in these regional economies. Many regions have large populations of organic growth small business that may drive significant revenue growth, and there is meaningful variation in the extent to which small businesses exit these economies in their first few formative years.

Figure 7: Small manufacturers and wholesalers were especially likely to be in the financed growth segment, while organic growth firms were prevalent in all industries, including services



Note: The share of micro stable firms ranged from 17.1% (High-Tech Manufacturing) to 38.9% (Personal Services), and the share of stable small employer firms ranged from 2.1% (Real Estate) to 8.1% (Restaurants).

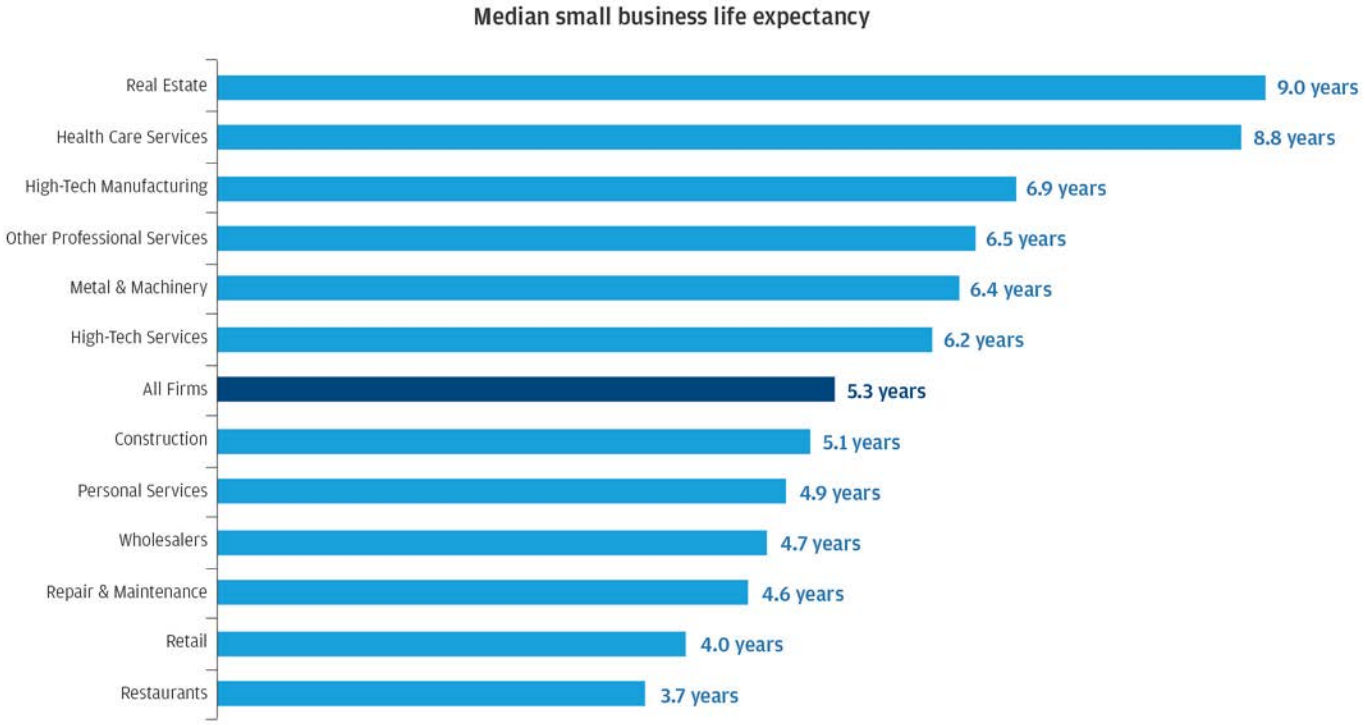
Source: JPMorgan Chase Institute

In addition to variation by regional economies, many observers have drawn attention to the possibility of meaningful differences in dynamism by industry. Along these lines, some policy makers seek to invest in specific technology-intensive industries as a way of stimulating economic growth.[8,9,10] By focusing on the intensity of external finance, our own definition of financed growth small businesses similarly seeks to identify business models premised on investments in assets that could lead to scalable growth in ways that might be more common in some industries than others. Accordingly, we next turn to the distribution of dynamic small business segments by industry.

While organic growth firms may individually be small, they generate the majority of revenues and are widely distributed across metro areas and industries.

Figure 7 shows the share of financed growth and organic growth firms across our 12 industries. The difference in the concentration of financed growth firms by industry is markedly wider than the differences we observed across metro areas. In our sample, 16.5 percent of high-tech manufacturing firms were financed growth firms, while only 0.6 percent of repair and maintenance firms were—high-tech manufacturing firms were over 27 times more likely than repair and maintenance firms to be in this segment. Differences among shares of organic growth firms were smaller. High-tech services small businesses were the most likely to be in the organic growth segment at 61 percent, while personal services were the least likely at 47 percent.

Figure 8: Median small business life expectancy differed substantially by industry



Note: We estimate median small business life expectancy by determining an annualized exit rate from Year 1 to Year 3 and assuming constant exit rates over time.

Source: JPMorgan Chase Institute

Figure 8 shows estimated median small business life expectancy for each of our 12 industries and for all firms. With median life expectancies of 9 and 8.8 years respectively, small real estate and health care services firms were substantially less likely to exit than were other firms in our sample. High-tech manufacturing firms had both relatively long life expectancy and the highest share of financed growth firms.

Notably, the personal services, repair and maintenance, and restaurant industries had comparatively low shares of both financed growth and organic growth firms, as well as relatively short life expectancies. These industries also are likely to have firms that carry relatively low cash liquidity (Farrell and Wheat, 2016). Along similar lines, small high-tech manufacturers and real estate firms have some of the longest life expectancies in these analyses, while maintaining larger cash buffers than small firms in other industries.

Finding Three

Nonemployer small businesses are more likely to exit than to hire employees.

A number of recent policy proposals have drawn attention to the possibility of generating inclusive and broad-based economic growth through increased employment in the small business sector. The "Just Add One" initiative from the National Association of Workforce Boards,[11] the "One in Three" initiative from the Association of Enterprise Opportunity,[12] and recent empirical research on the impact of small businesses on job creation in inner cities (JPMC and ICIC, 2016) all observe how the creation of one job by a substantial fraction of microbusinesses could substantially alter the employment landscape. While proponents of these job creation efforts note the difficulty very small businesses might face adding employees, little empirical evidence exists that documents the prevalence of the transition from nonemployment to employment (Davis et al., 2009; Fairlie and Miranda 2016).

Like many other proposed small business segmentations, our segmentation divides small businesses based on their employment status and outcomes in their first year(s)—we define small employers as those businesses that make payroll payments in their first year. In this, our segmentation suggests that employment is a fairly stable distinction among small businesses. We empirically test this assumption in our data by determining whether each firm in our sample is an employer for each year of its life, and summarizing transitions between employment and nonemployment across our sample.

Figure 9: Few nonemployer small businesses become employers within the first four years

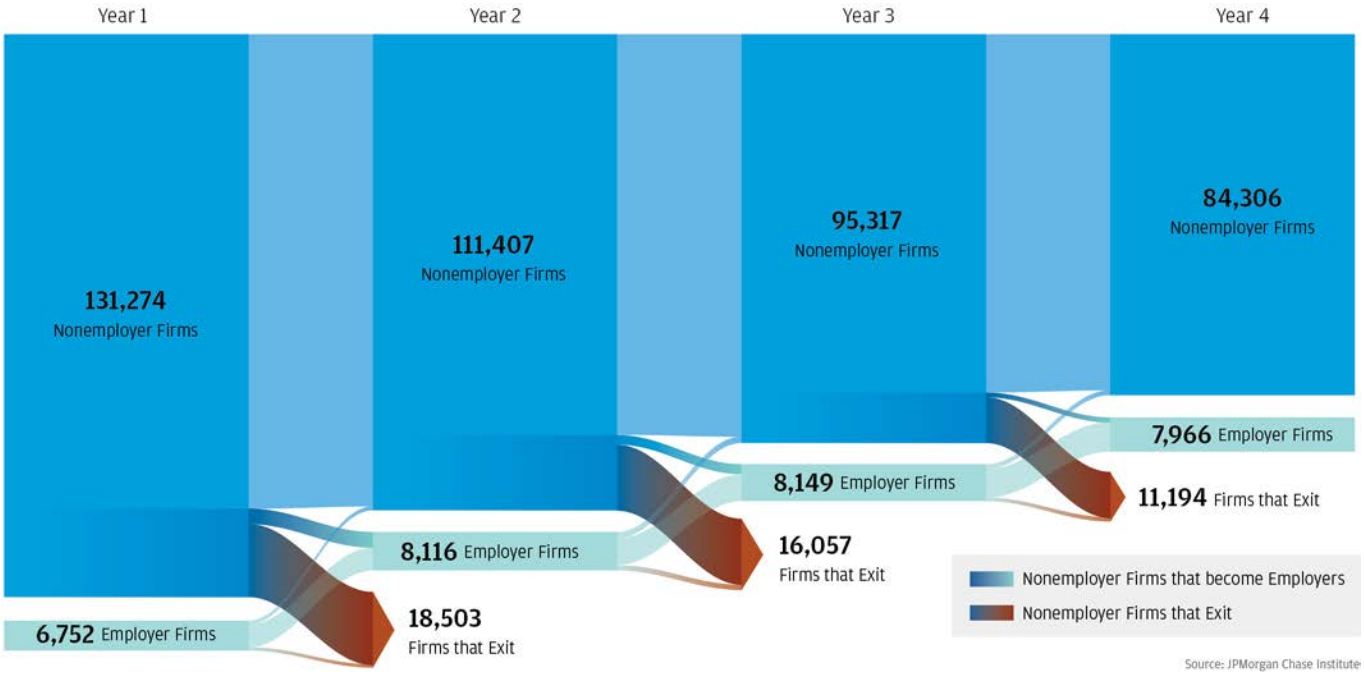


Figure 9 shows the transitions within and across employment statuses for the firms in our sample over their first four years. The figure shows that in each year, the overwhelming number of nonemployer businesses in a year remain nonemployers, and the overwhelming number of employer businesses remain employers. A small fraction of nonemployers do become employers every year, and those constitute a nontrivial share of employers. Some number of employers return to nonemployment each of these years as well.

One of the most common transitions Figure 9 shows clearly is exits by nonemployer firms, which are notably more frequent than exits by employers. We use our full sample of 1.3 million firms to examine these specifically and over a wider span of firm ages in Figure 10. The figure shows that for the first ten years, the exit rate for nonemployer businesses at each age is more than five times higher than the rate at which nonemployers become employer businesses. Moreover, at 2.5 percent, this rate is substantially higher for firms less than a year old than it is for firms at any other age.[13] 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. Moreover, over 85 percent of firms in this sample never have any payroll outflows.

Figure 10: Nonemployer exit rate outpaces transition to employment rate at every age

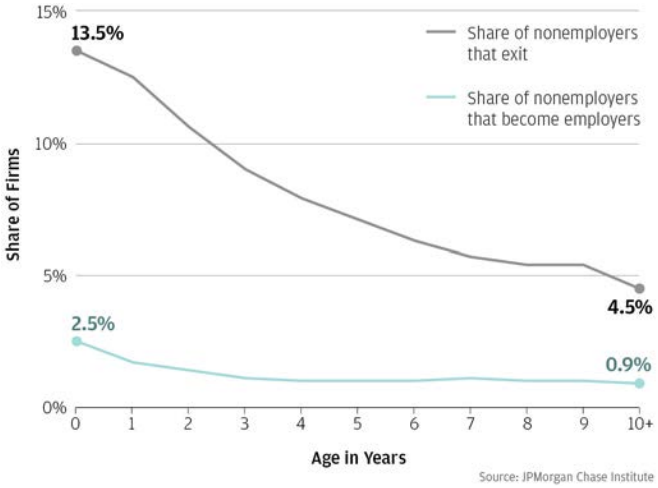
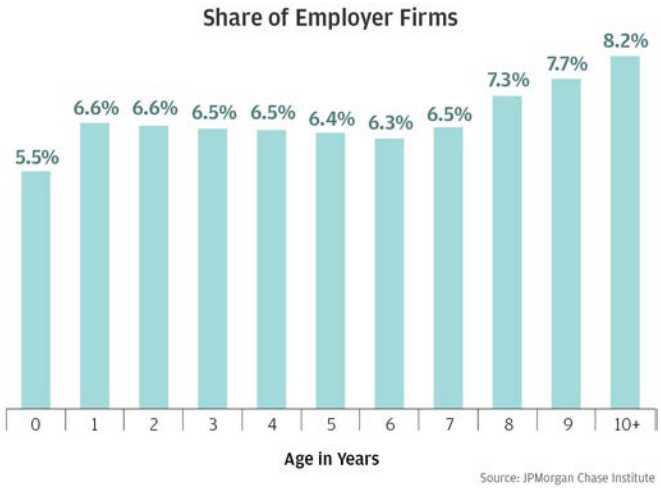


Figure 11: The share of employer businesses within a cohort grows as firm age



Increasing shares of employer firms by business age result from nonemployer exits rather than nonemployer transitions to employment.

One consequence of these employment dynamics is that within a cohort, the share of employer firms tends to grow as firms age. Figure 11 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.

Overall, Findings 1 through 3 present a view of the small business sector in which some small business characteristics seem quite stable. In particular, few firms transition between nonemployer and employer status. Stability in employment status notwithstanding, we observe a large segment of largely nonemployer businesses in the organic growth segment that make substantive contributions to the economic activity of the sector. While they may individually be small, these organic growth firms generate the majority of small business revenues, and are widely distributed across metro areas and industries.

Part II: Cash Flow Patterns and Small Business Performance

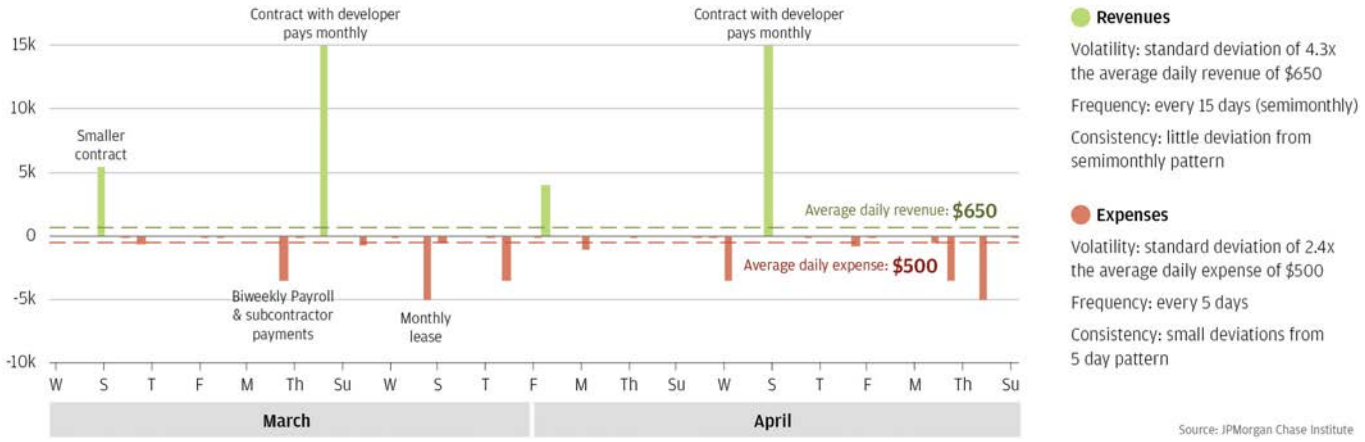
We began this report with a segmentation of the small business sector based on size, complexity, and dynamism and described each segment's aggregate performance, particularly in the first few years after founding. In Part I, as well as in much of the literature on business dynamism, growth rates—expressed in annualized terms—describe the steady expansion of new businesses, at least for those that survive. Time trends that appear relatively smooth in the aggregate are rarely experienced with any certainty by an individual firm. The irregularity of cash flows within any given period could be a key factor in whether a small business survives and grows. In Part II, we leverage the granularity of our data to develop a framework for analyzing cash flow patterns and use that framework to examine how firms' cash flow patterns transition as they mature. We then provide insight about the cash flow management problems faced by firms in each small business segment.

In previous research, we found that a typical small business has less than one month of cash buffer days (Farrell and Wheat, 2016).[14] That is, it only has enough cash on hand to cover less than a month of expenses in the event of a total disruption in revenues. In our work analyzing small businesses after hurricanes Harvey and Irma, we found that firms were often able to cut back on expenses when they suffered the large shock to revenues, and this adaptability helped them survive and rebound.

Our prior work on the financial fragility and resilience of small businesses after facing a large negative shock motivated us to analyze further the cash flow management problem small businesses face. Every business must manage expenses in light of its revenues, but the task could be even more crucial for small businesses, which may have more limited access to lines of credit than larger ones.

For example, consider Small Dollar Electric, our earlier fictional example of an organic growth business. Figure 12 depicts two months of stylized cash flows for this fictional firm. Its largest client, a developer, pays every month, and there are occasional smaller contracts. While the firm bills its clients promptly, customers typically have up to 30 days to pay, so it is not always clear when Small Dollar will collect payments even though it expects and plans to receive certain amounts of revenue when the contracts are negotiated. Its annual revenue is about $240,000, which implies average daily revenues of about $650. The largest expenses are the monthly office lease ($5,000), biweekly payroll and subcontracting costs ($3,500) and utilities. Other miscellaneous expenses are also paid throughout the month; most weeks, there is at least one bill to pay. The subcontracting bill is lower when business is slow, but the firm must make the lease and payroll payments for the office manager regardless of the contracts. This stylized example shows a particularly regular pattern in order to illustrate daily cash flows and the analytical measures we developed to describe them. Very few real firms would have cash flows that deviate so little from their average patterns.

Figure 12: Two months of cash flows for Small Dollar Electric



In order to describe empirically the cash flow management problem inherent in each small business, we developed four measures: three that quantify the irregularity of cash flows with respect to amounts and timing—volatility, frequency, and consistency—and one that gauges the use of financing. The volatility measure characterizes the regularity of the cash flow amount. Cash flows exhibiting high volatility are ones that deviate greatly from their daily averages, while low volatility would indicate a similar amount every day. Applied to revenues and expenses separately, volatility can be used to compare the regularity of revenues with that of expenses. In the example of Small Dollar Electric, revenue volatility is somewhat higher than expense volatility, indicating that revenues deviate more from their averages than expenses.

The timing of cash flows is described by two additional measures of irregularity, frequency and consistency. Frequency describes the typical schedule of sizable cash flows. Firms with sizable cash flows every week have relatively high frequency, while ones with larger cash flows every few months have relatively low frequency. Small Dollar Electric, our fictional contractor, pays bills almost every week and has a weekly expense frequency. With a relatively small number of clients, the firm receives payments with lower frequency, usually about twice each month. Our third measure, consistency, describes how often and by how much the timing of cash flows deviates from its frequency. For example, weekly cash flows that never deviate from the weekly pattern are cash flows with high consistency.

The fourth measure, the use of financing, is the total financing inflows as a percentage of the total inflows for the year. Financing inflows include loan proceeds as well as transfers from the owners' personal accounts. The Methodological Appendix provides a more detailed explanation of the four measures and their application.

We applied each of the cash flow regularity measures (volatility, frequency, and consistency) to both revenues and expenses and calculated the financing utilization to obtain a total of seven quantitative features describing the cash flows for each firm. We then used clustering techniques on the set of features to identify seven combinations of cash flow patterns that can help us understand the cash flow management problems small businesses face at different stages of their lifecycles. In the remainder of Part II, we will use these clusters to characterize the more common cash flow patterns by firm age and small business segment, although firms in each segment could experience cash flow patterns in any cluster at any age.

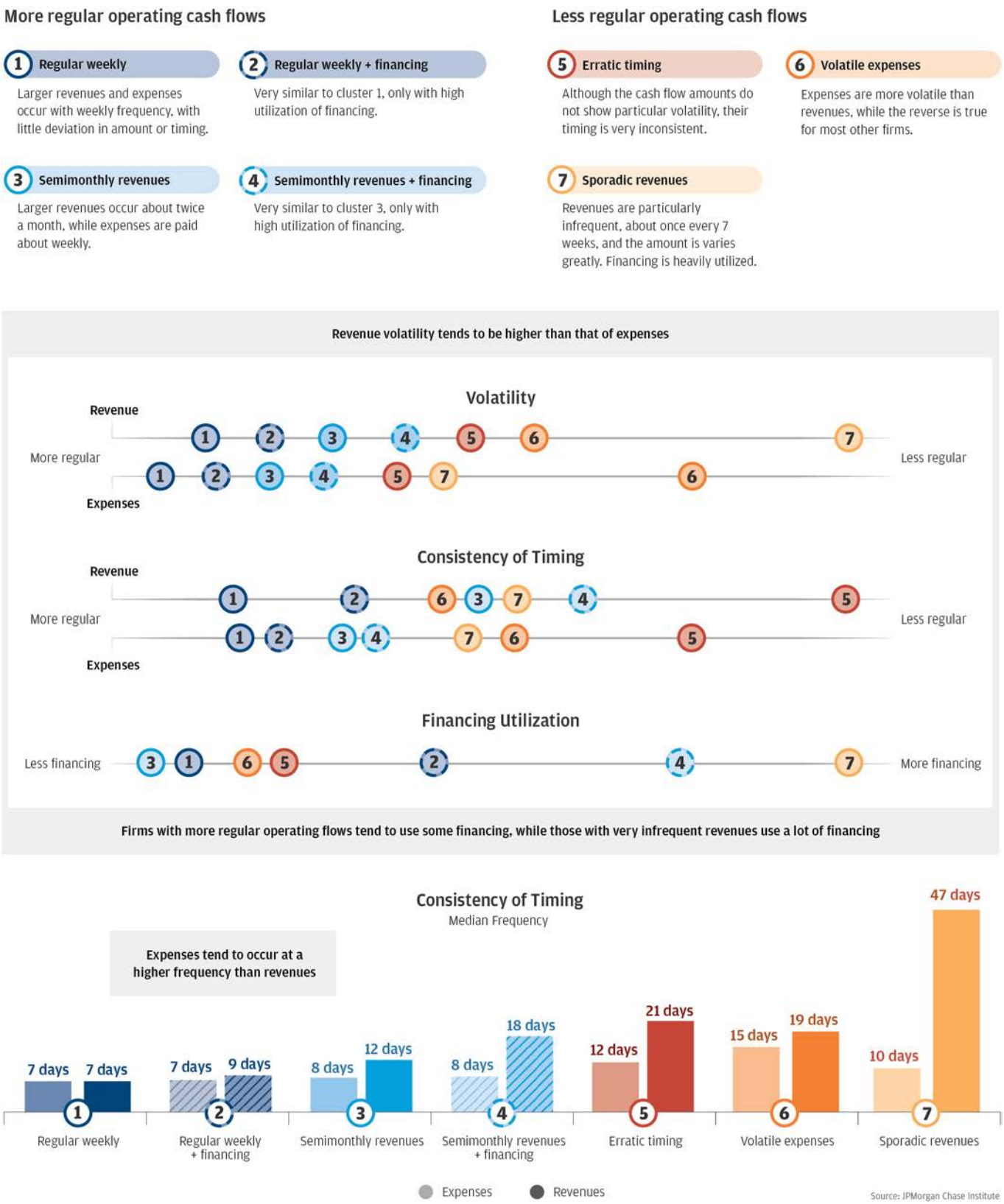
Figure 13 summarizes the relative regularity of revenues and expenses as well as the financing utilization for each cluster. While some clusters may have similar characteristics in one dimension (e.g., clusters 5 and 6 have similar revenue volatility), each cluster has one or more features that distinguishes it from the others.

Figure 13 also shows the volatility, frequency, and consistency of revenues and expenses for each cluster, as well as the typical financing utilization. For each of these measures, there is a continuum that ranges from relatively more regular to relatively less regular. For example, cluster 7 has particularly high revenue volatility and medium expense volatility. Revenues occur at a lower frequency than in other clusters, about every 7 weeks, but they do not deviate too much from that schedule. The consistency of revenue timing is medium. In addition, firms in this cluster have high financing utilization. This combination of characteristics epitomizes cluster 7, the sporadic revenues cluster.

For convenience, we will refer to cash flows with particularly large deviations from their average patterns (either in amount or timing) as less regular, compared to more regular patterns with smaller deviations. However, it is important to note that even the relatively more regular patterns are not regular in an absolute sense. Also, irregularity for our purposes does not imply that cash flows are necessarily unexpected. For example, our fictional firm, Small Dollar Electric, expects certain revenues per contracted terms, but it is not always clear when the payments will arrive.

As noted earlier, almost all firms experience some degree of irregularity. Nevertheless, those in clusters 1-4 have relatively more regular cash flow patterns. Clusters 5-7 are each distinguished by particularly high irregularity in one area. For cluster 5, it is timing, and for clusters 6 and 7, it is expenses and revenues, respectively.

Figure 13: Firm cash flow patterns can be classified into seven clusters, representing different cash flow management problems firms face



To provide additional context, we use the four fictional firms from Part I to illustrate the dynamics of cash flow patterns in Boxes 5-8.

Box 5: For Friends Burgers

7 Sporadic Revenues to **2 Regular Weekly + Financing**

2013	2017
Typical Revenues None	**Typical Revenues** Daily ACH deposits from merchant servicers
Key Expenses Administrative staff payments	**Key Expenses** Weekly payroll, COGS
External Finance Equity investments from friends and family	**External Finance** Series B equity

For most of 2013, the For Friends founding team barely sold a burger. As part of an effort to perfect their recipes, build a social media brand, and attract the attention of future investors, the founders spent much of their time entering burger cooking competitions and doing catering events targeted at higher net worth customers. They opened their first retail location in September 2013. By the end of the year, the team was able to raise $1 million to fund a regional advertising campaign ahead of opening their next four retail locations in early 2014.

As part of their growth plan, For Friends entered its new markets with aggressively competitive pricing below its production costs. The firm was able to attract a Series A round of financing in 2014 and a Series B round of financing in early 2016 in order to finance opening several new storefronts and make large traditional and social media buys as part of an aggressive media campaign. While these expansion efforts were successful in terms of revenue growth, they further accelerated operating losses.

In mid-2016 For Friends changed its pricing structure under pressure from its investors in order to lower its burn rate. The market response to these price changes was poor, resulting in a sharp decline in revenues. After struggling to find a workable price structure for several months, the firm shut down all operations by late 2016.

Box 6: Small Dollar Electric

5 Erratic Timing to **4 Semimonthly Revenues + Financing**

2013	2017
Typical Revenues Payments from developers	**Typical Revenues** Payments from clients
Key Expenses Rent, COGS	**Key Expenses** Payroll, rent
External Finance Transfers from personal account	**External Finance** SBA loan

Small Dollar Electric found its first client engagement in 2013, a local developer with whom Mary established a working relationship before deciding to open her business. After this successful engagement, she signed a commercial lease for office space, and paid for a few advertisements in local trade journals. This led to her second client engagement—pitched as a six-month engagement. Unfortunately this new client was a less reliable customer, who began making increasingly late payments, and eventually stopped making payments altogether as the project collapsed. In order to cover her expenses while looking for new clients, Mary reached into her personal savings.

Over the next several years, Small Dollar Electric began to focus on larger, more reliable clients, with an increasing focus on the public sector. In particular, Mary worked hard to secure monthly fixed payment terms for longer term projects, and typically worked across two to three such projects at any given time.

In mid-2016 Small Dollar Electric applied for and received an SBA loan to support the purchase of specialized equipment required for many of its new contracts.

Box 7: Suburban Dermatology

4 Semimonthly Revenues + Financing to **3 Semimonthly Revenues**

2013	2017
Typical Revenues Payments from insurers	**Typical Revenues** Payments from insurers
Key Expenses Payroll, rent	**Key Expenses** Payroll, rent
External Finance Transfers from personal account	**External Finance** None

In developing her initial plans for Suburban Dermatology, Dr. Xi insisted on bringing along an office manager with a lot of experience managing billing with insurance companies. Her experience at County General suggested that this would be a key factor for success. This investment paid off well for the firm. Within a few months after opening, Suburban Dermatology began receiving consistently timed payments from insurers, even as Dr. Xi grew her patient base. While Dr. Xi also accepted cash payments for some procedures not covered by insurance firms, the majority of her collections came from covered procedures.

In her first months of operation, Dr. Xi was able to personally finance Suburban's set up costs out of savings she retained from her work at County General.

By 2017, Suburban Dermatology had developed a more stable repeat customer base, but largely saw the same cadence of cash flows as it did in its first year doing business.

Box 8: Everyday Dry Cleaners

6 Volatile Expenses to **1 Regular Weekly**

2013	2017
Typical Revenues Cash deposits every two to three weeks	**Typical Revenues** Daily ACH deposits from merchant servicers
Key Expenses Large and varying expenses for equipment	**Key Expenses** Regular payments for utilities, lease payments
External Finance Transfers from personal accounts	**External Finance** None

When Janine and Harold founded Everyday Dry Cleaners in 2013, their finances were off to a rocky start. They had a number of small but substantial startup expenses, from purchasing new signage, advertising expenses in local publications, start up payments for insurance, and down payments on minor pieces of equipment. Moreover, while they thought they had gotten a deal on the purchase of used industrial washers and dryers, their initial equipment had so many maintenance problems that they went into their personal savings to purchase more expensive equipment from a more reputable supplier. Revenues were slow to build for the first few months, so low in fact that the Kostners only deposited cash payments at their bank every two or three weeks.

By 2017, business had picked up at Everyday Dry Cleaners. Janine and Harold transitioned from a cash-only business to one where customers mostly pay using credit and debit cards. While Janine and Harold recently replaced some of their cleaning equipment, they did so with a firm that rents and services industrial washers and dryers. As a result, the largest and most significant payments in a month are consistent lease payments for equipment, rent for their retail space, and electric and gas utility payments.

Finding Four

New small businesses achieve more stable and regular cash flow patterns over time, or exit.

Firms may have different cash flow management problems at different points in their lifecycles. For example, firms may initially have less frequent or more irregular revenues. As they mature and increase their customer base, their revenues may become increasingly regular. We used our cohort of small businesses founded in 2013 to investigate this evolution by analyzing their cash flow patterns as they matured.

Figure 14: Firms surviving the first four years often transition into more regular cash flow patterns

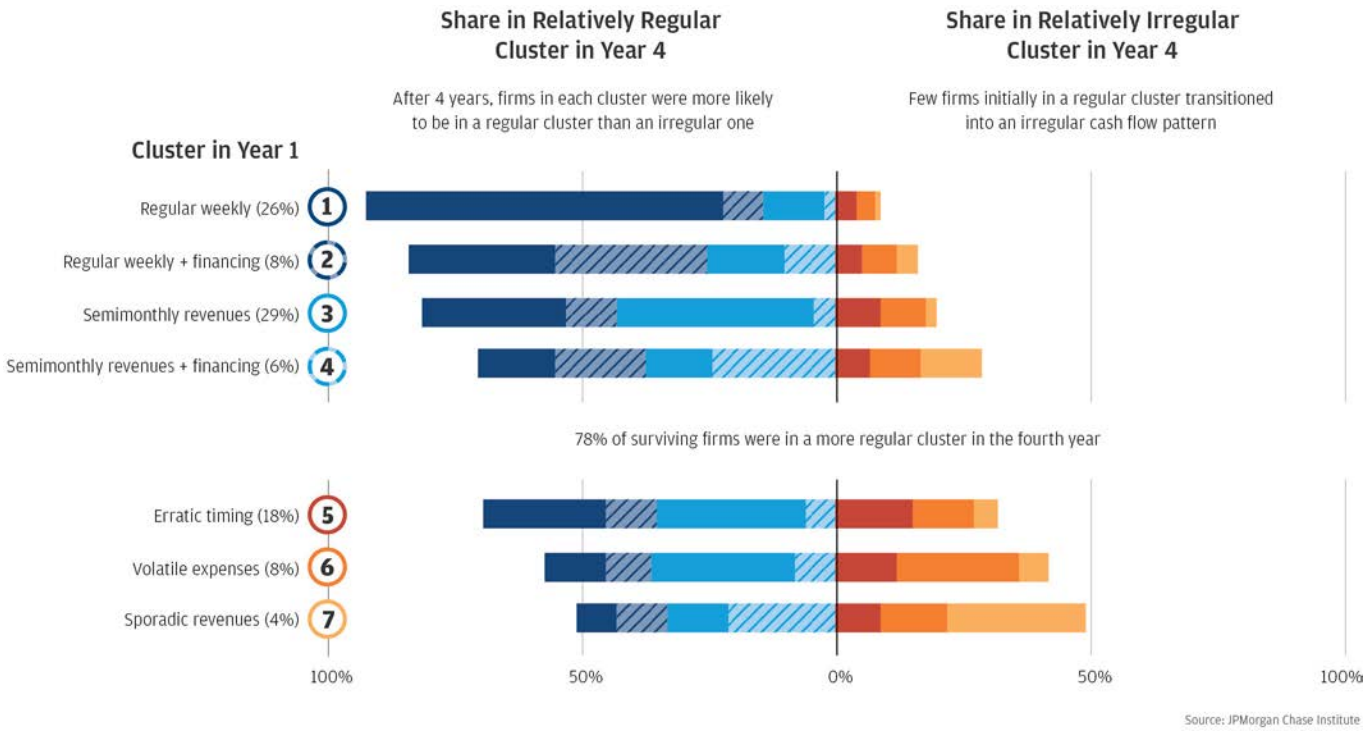


Figure 14 shows how firms' cash flow patterns changed from their first year to their fourth. Each bar represents firms with one of the seven cash flow patterns in the initial year. The composition of each bar shows the distribution of cash flow patterns in the fourth year for firms from the same initial cluster. For each cluster from the first year, at least half of the cluster was in one of the more regular clusters four years later. For example, 4 percent of the cohort was initially in cluster 7, the sporadic revenues cluster. Four years later, 51 percent of the surviving firms in that cluster were in one of the four more regular clusters four years later. Another 27 percent remained in the same cluster, and 22 percent moved to a different irregular cluster, either cluster 5 or 6. Firms initially in one of the more regular clusters were relatively less likely to transition into one of the less regular clusters.

During their first year, 31 percent of firms in this cohort experienced relatively irregular cash flows, as characterized by clusters 5-7. After four years, this cohort's cash flows become more regular, with 78 percent in clusters 1-4 and the remaining 22 percent in relatively irregular clusters 5-7. That represents a significant shift of nine percentage points from irregular clusters to more regular ones.

Figure 15 shows that relatively regular cash flow patterns are also indicators for future survival. Firms in cluster 1, based on their cash flow patterns in the prior year, exited at the lowest rates at each age, compared to other firms in the cohort. Firms with relatively regular cash flow patterns exited at lower rates at each age than those with more irregular cash flows. In particular, 30 percent of firms in cluster 6, the volatile expenses cluster, exited after their first year, a rate significantly higher than any other cluster. This cluster is characterized by expense levels that are very irregular, and likely more irregular than revenues. In contrast, for many firms, expenses are relatively more regular than revenues. This suggests that large and perhaps unexpected expenses could be especially difficult for small businesses to manage.

Figure 15: Exit rates by age and cash flow pattern

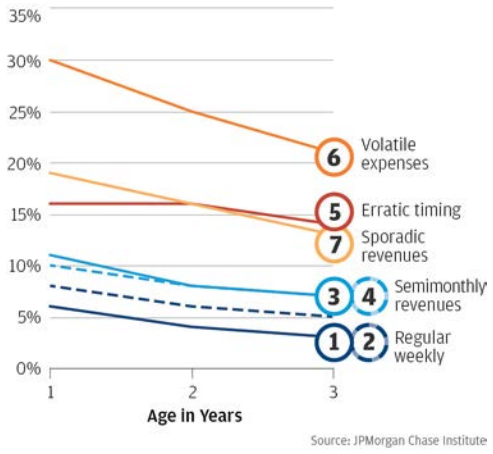
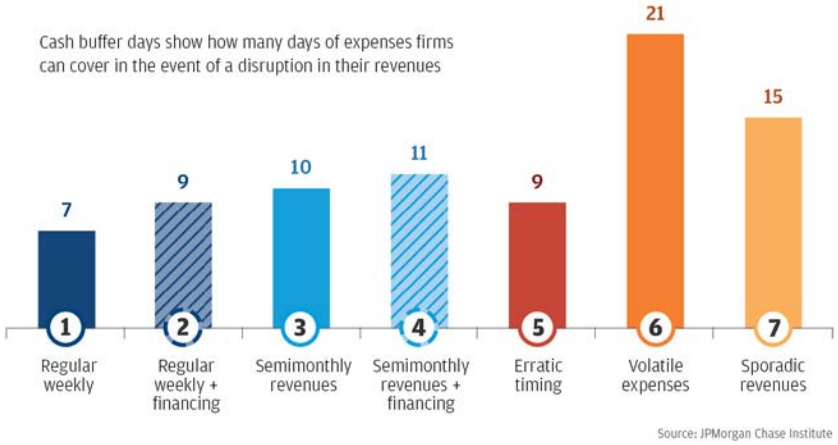


Figure 16: Median cash buffer days in year 2, by cash flow pattern



Firms in each cluster may manage the differing patterns of cash flows by holding more or less cash. Figure 16 applies the concept of cash buffer days—the number of days during which firms could cover expenses in the event of a total disruption to revenues (Farrell and Wheat, 2016)—to firms in each cluster during their second year, although the pattern is similar in each year of operations. Typical firms in the volatile expenses cluster (cluster 6) had 21 cash buffer days, notably more than other clusters. This may be a method of mitigating the very irregular levels of expenses that is a feature of this cluster. Analogously, firms in cluster 1, with relatively regular weekly cash flows and little financing utilization, held fewer cash buffer days than firms in other clusters. Firms in the erratic timing cluster, which is characterized by cash flows with large deviations in frequency, held about the same number of cash buffer days as other firms in some of the more regular clusters. While the erratic timing cluster is quite inconsistent in the timing of its cash flows, it is not particularly irregular with respect to the amount, and that could be congruent with cash buffer days that are not especially high.

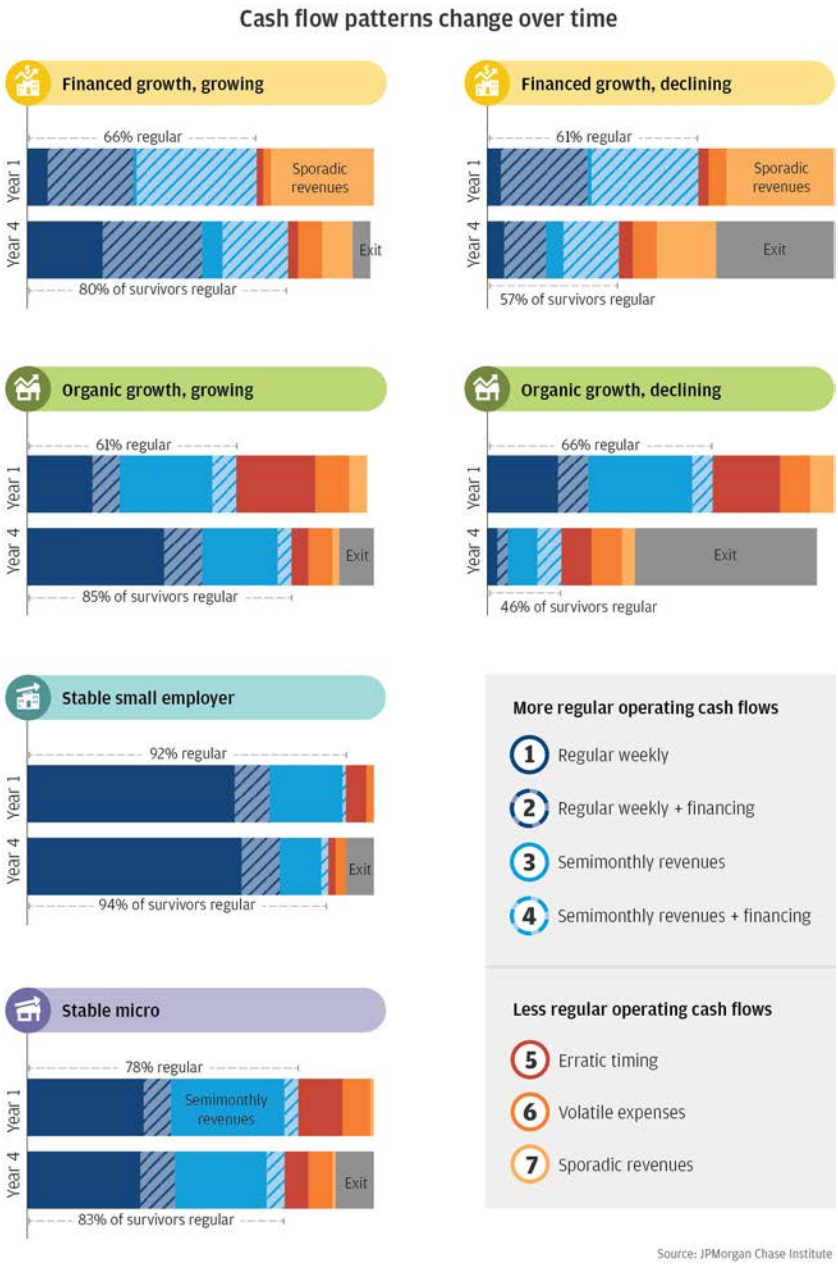
Finding Five

Stable firms survive, growing dynamic firms transition to more regular cash flow patterns, and dynamic firms that fail to grow exit.

In Part I of this report, we introduced a segmentation of the small business sector based on size, complexity, and dynamism observed in the first four years of the firm lifecycle. In Finding 1, we further differentiated firms in the financed growth and organic growth segments on the basis of revenue growth. Regardless of its growth strategy or other characteristics, every firm must manage its cash flows in order to survive and thrive. This cash flow management problem varies depending on the timing and volatility of its revenues relative to the timing and volatility of its expenses. The previous section developed analytical measures to describe cash flow patterns empirically and offered seven clusters—combinations of patterns in revenues, expenses, and financing utilization—that help distill the wide range of patterns into a recognizable set of cash flow management problems.

The segmentation in Part I provides a framework for classifying the types of small business, while the clusters in Part II describe the cash flow management problems small businesses face in a given year. Importantly, our longitudinal view of firms allows us to observe how their cash flow management problem changes over time, especially as they correspond to revenue growth or decline. The small business segmentation and the clusters of cash flow patterns seek to characterize different phenomena, but the intersection of the two can provide additional insights. Some of these insights reinforce our understanding of the different small business segments, while others help illustrate the challenges small businesses face in managing their cash flows, especially if they are new and dynamic.

Figure 17: Stable firms survive, growing dynamic firms transition to more regular cash flow patterns, and dynamic firms that fail to grow exit



Source: JPMorgan Chase Institute

While not unexpected, the distributions of cash flow patterns by segment are nevertheless notable for their clarity. First, consider the large share of firms in the financed growth segment which are in clusters with high financing utilization (clusters 2, 4, and 7). Since the financed growth segment was defined as firms meeting a threshold amount of financing in the first year, this may not be surprising. However, the relatively high financing utilization of clusters 2, 4, and 7 are not predicated on any dollar threshold of financing. Rather, they indicate that financing inflows are high relative to the firm's total inflows. So while every firm in the financed growth segment has financing inflows of at least $400,000, our cash flow pattern analysis shows that for most firms in this segment, this also represented a large share of total inflows. At the same time, firms in other segments also included firms with high financing utilization, even if they did not meet the threshold.

Second, among firms in the stable small employer segment both initially and after four years, over 90 percent exhibit relatively regular cash flow patterns (clusters 1-4). This segment makes consistent payroll payments and does not experience revenue growth in the extremes, so the stability of their cash flows is not surprising. Nevertheless, the overwhelming share of firms with regular cash flow patterns is striking.

Third, consistent with Finding 4, firms within most segments transition into more regular cash flow patterns over time. For growing firms in the financed growth and organic growth segments, as well as the stable small employer and stable micro segments, the share of firms in one of the regular cash flow patterns (clusters 1-4) in the fourth year is higher than the share in the first year. However, we observe the reverse among declining firms in the financed growth and organic growth segments. Even among the surviving firms, the relatively regular cash flow patterns are less common in the fourth year than the first. Moreover, larger shares of declining firms exit by the fourth year, compared to growing firms within the financed growth and organic growth segments, despite having a similar distribution of cash flow patterns in the first year. Over half of the declining organic growth firms did not survive four years, in contrast to 10 percent of growing firms in that segment.

Our analysis of cash flow patterns by small business segments also reveals that the most common type of irregular cash flow pattern varies by segment, which provides insight about the challenges new dynamic firms face. In the financed growth segment, about 30 percent of firms in the first year belonged to cluster 7, which is characterized by highly volatile and infrequent revenues as well as high financing utilization. By the fourth year, the share of firms in this segment with this cash flow pattern had decreased, especially for those that were growing. Among growing financed growth firms in their fourth year, 10 percent of surviving firms are in the sporadic revenues cluster, compared to 26 percent of the declining financed growth firms.

We note a similar pattern in the organic growth segment with respect to a different type of irregular cash flow pattern, erratic timing (cluster 5). This cluster is characterized by the irregular timing in both revenues and expenses. That is, while revenues and expenses are not particularly infrequent on average, there are large deviations from the typical timing of these cash flows. Over 20 percent of firms in the organic growth segment exhibited the erratic timing pattern in their first year. By the fourth year, only 6 percent of survivors in the growing organic growth segment were in this cluster. Among the declining organic growth firms, 19 percent experienced the erratic timing pattern in the fourth year; there was little decrease in the prevalence of this pattern (and an increase in the prevalence of the other two types of irregular cash flows) for declining firms.

Regardless of its growth strategy or other characteristics, every firm must manage its cash flows in order to survive and thrive.

Combining the segmentation introduced in Part I with the cash flow patterns developed in Part II results in insights about the cash flow management problems different types of small businesses face at various stages in their lifecycles. New and dynamic firms are particularly likely to experience sporadic revenues and erratic timing of both revenues and expenses.

Conclusions and Implications

The small business sector plays an important role in national dialogues about both the potential decline in business dynamism as well as the ability of a growing US economy to benefit a wide range of citizens. Our empirical work in this report largely focuses on young small businesses in their first four years, an especially critical time in the lifecycle of a small business, many of which are challenged to survive beyond five years. Based on these findings, we offer the following implications for leaders and decision makers:

- **The foundation for economic growth and dynamism includes all small businesses, not just financed growth small businesses.** While high-growth success stories deserve to be celebrated, they are rare. Most small businesses do not achieve and perhaps do not even attempt to achieve that type of success, but they nevertheless produce large shares of small business revenue and employment, especially in their first few years. This revenue can be the livelihoods of small business owners and their families, and the associated tax revenues support their communities.

- **While most small businesses do not—and will not—hire employees, small businesses can contribute to the economy without creating large numbers of jobs, or jobs at all.** Economic policies with considerations for small businesses often focus on small employers without regard to their effects on nonemployer small business owners.[15] Policy makers should consider how policies could affect all forms of entrepreneurship and business dynamism. Moreover, given the relatively low incidence of nonemployer to employer transitions, policy makers should invest cautiously in programs that seek to create large numbers of jobs by encouraging broad populations of nonemployers or micro employers to create one or two additional jobs. In contrast, there may be less-commonly explored opportunities to generate economic impact by encouraging revenue growth among nonemployer and micro employer firms.

- **Entrepreneurship and dynamic growth are not limited to a few industries or regions.** While financing-intensive high-growth small businesses may be substantially more common in areas with strong and long-standing small business finance institutions, small businesses that achieve organic growth are quite common across a wide variety of industries and metro areas. Local economic developers should consider dual-pronged approaches to generating growth in the small business sector that target the development of both kinds of high-growth small firms.

- **Working capital loans and lines of credit could help small businesses manage their irregular cash flows.** Small businesses have a wide range of financing needs, from working capital loans and credit lines that help finance everyday operations to longer term loans that finance large capital investments. Not every small business needs or wants to finance large capital investments, but nearly all small businesses must manage their cash flows in order survive and grow. A wider range of entrepreneurs could benefit from more accessible and lower cost short-term financing options that could be used to manage irregular cash flows.

- **Cash flow management is as important as liquidity for small business growth.** While liquidity is a critical input to small business growth, a firm that gets credit but cannot properly manage its cash flow is unlikely to successfully grow and contribute to either the aggregate economy or even to the financial well-being of its owners. Moreover, the specific cash flow challenges growing firms have vary meaningfully by segment. Policies, programs, and even technical assistance should be targeted to the specific kinds of cash flow problems small businesses face, and increased investment in these programs may enhance the effectiveness of efforts to increase access to credit and capital.

Data Asset & Methodological Appendix

Constructing our Samples

Full sample – We constructed a sample of 1.3 million firms who hold Chase Business Banking deposit accounts and meet our criteria for small operating businesses in core metropolitan areas. We then used over 3.1 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. Firms in our full sample:

- Hold Chase Business Banking accounts 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
  - Operate in one of the 12 industries that are characteristic of the small business sector: Construction, healthcare 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 386 metropolitan areas where Chase has a representative footprint
  - 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 1.3 million firms, we identified a cohort of 138,000 firms that were founded in 2013. Our longitudinal view allows us to fully observe up to the first four years of these firms' operations, 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. Details on how we identify payroll outflows are available in our report on small business employment (Farrell and Wheat, 2017b).

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.

Methodological Appendix

In Part II, we developed four measures that characterize small businesses' cash flow patterns. Three of those measures—volatility, frequency, and consistency—described the regularity of cash flow amounts and timing, and the fourth gauged financing utilization. We applied these measures to firms' cash flows to characterize their daily cash flows patterns empirically and used clustering methods to distill the wide range of patterns into seven recognizable cash flow management problems. This appendix will review the methodology used to (1) decompose the time series, (2) derive clusters of cash flow patterns, and (3) train a predictive model.

Decomposing the cash flow time series – Our data asset includes transaction-level data for each firm in the sample. In order to analyze daily cash flows, we first classify all transactions as revenues, expenses, or financial flows based on anonymized transaction descriptions.

Distinguishing financial flows, which include transfers in and out of other accounts, from other cash flows ensures that such transfers are not considered revenues or expenses. Examples of financial inflows include external financing, which could be transfers from owners' personal accounts or electronically transferred loan proceeds. Financial outflows could include owners' draws from firm accounts into their personal accounts.

Cash flows that are not financial flows are either revenues (inflows) or expenses (outflows). Additionally, we identify some types of expenses, such as payroll. Cash and check transactions do not have transaction descriptions, so we cannot ascertain whether they are financial flows; they are assumed to represent revenues or expenses.

All transactions are then aggregated by firm to create daily time series of revenues, expenses, and financial flows. The patterns of daily revenues and expenses were then characterized by three measures—volatility, frequency, and consistency—and a fourth, financing utilization, assessed the degree of financing. The formulas and algorithms used are discussed below. Cash flow features are typically calculated for each year of each firm.

- **Volatility** – Measures the standard deviation of the cash flow relative to its daily average, which includes days in which there are no cash flows. High values in volatility indicate large deviations in the cash flow amounts relative to the daily average. The volatility of cash flows *(CF)*, either revenues or expenses, during year *t* is given by:

$$Volatility_t = \frac{Standard\ Deviation\ (CF_t)}{Average\ (CF_t)}.$$

- **Frequency** – Measures the typical number of days between local maxima (minima) in revenues (expenses). Local maxima (minima) are determined using an algorithm that ascertains the largest (smallest) daily cash flow within a rolling six day period. The number of days between the peaks is the periodicity, and the frequency represents the average number of days between these peaks. Large frequency measures indicate relatively high frequency events (e.g., weekly). The frequency of cash flows *(CF)* during year *t* is given by:

$$Frequency_t = \frac{1}{Average\ (Days\ between\ peaks\ of\ CF_t)}.$$

- **Consistency** – Measures the deviation of days between local peaks, or periodicity, from its average, or frequency. High values in consistency indicate large deviations in timing relative to the average timing of cash flows. The consistency of cash flows *(CF)* during year *t* is given by:

$$Consistency_t = \frac{Standard\ Deviation\ (Days\ between\ peaks\ of\ CF_t)}{Average\ (Days\ between\ peaks\ of\ CF_t)}.$$

- **Financing utilization** – Measures financing inflows during the year as a share of total inflows. Large values indicate that external financing is a large percentage of the firm's inflows. Financing utilization during year *t* is calculated as:

$$Financing\ utilization_t = \frac{Financing\ inflows_t}{Total\ inflows_t}.$$

Clustering Methodology – We applied each of the cash flow regularity measures (volatility, frequency, and consistency) to both revenues and expenses and calculated the financing utilization to obtain a total of seven quantitative dimensions describing the cash flows for each firm. We then used clustering techniques on the set of dimensions to identify seven combinations of cash flow patterns that provide insight about the cash flow management problems small businesses face at different stages of their lifecycles.

- **Training set** – In order to train our sample, we used a subsample of firms that met the filters described above in the Constructing Our Sample section for 2016. We used the firms that existed in 2016 because, at the point we trained the model, that was the latest full year available. However, we conducted sensitivity analysis for different earlier time periods and concluded the results were robust to time variations.

  Once we selected a sample of firms, we used 12 months of daily expenses, revenues and financial inflows in order to calculate the dimensions defined in the first part of this Methodological Annex. We used 12 months of activity to control for seasonality effects.

- **Parameters and algorithm** – We used the k-means clustering algorithm, which takes a predetermined number of centroids and assigns each data point to a centroid with the goal of minimizing distances within each cluster and maximizing difference between clusters. Our clustering algorithm used the cash flow dimensions for revenues and expenses, as well as the ratio of financing inflows to total inflows as the features of the model. The algorithm follows a stochastic process (initial centroids are randomly assigned at first), which required us to set a seed in the clustering implementation to get consistent results.

  The algorithm assigned each of the firms in our training set to one of the seven clusters. We then proceeded to analyze the distribution of each cluster in all seven dimensions and determined the characteristics that made each cluster unique and named them accordingly. The following figures map the distribution of the clusters in each of the seven dimensions.

Figure A1. Distribution of financing utilization across seven cash flow patterns

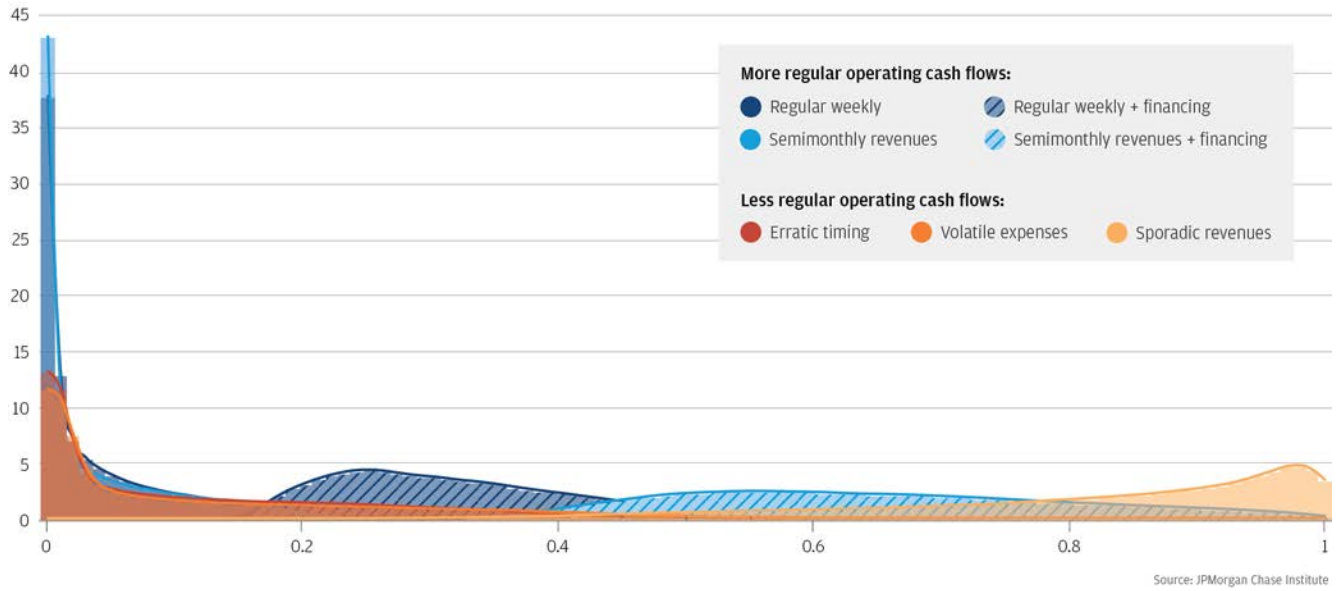


Figure A2. Distribution of frequency across seven cash flow patterns

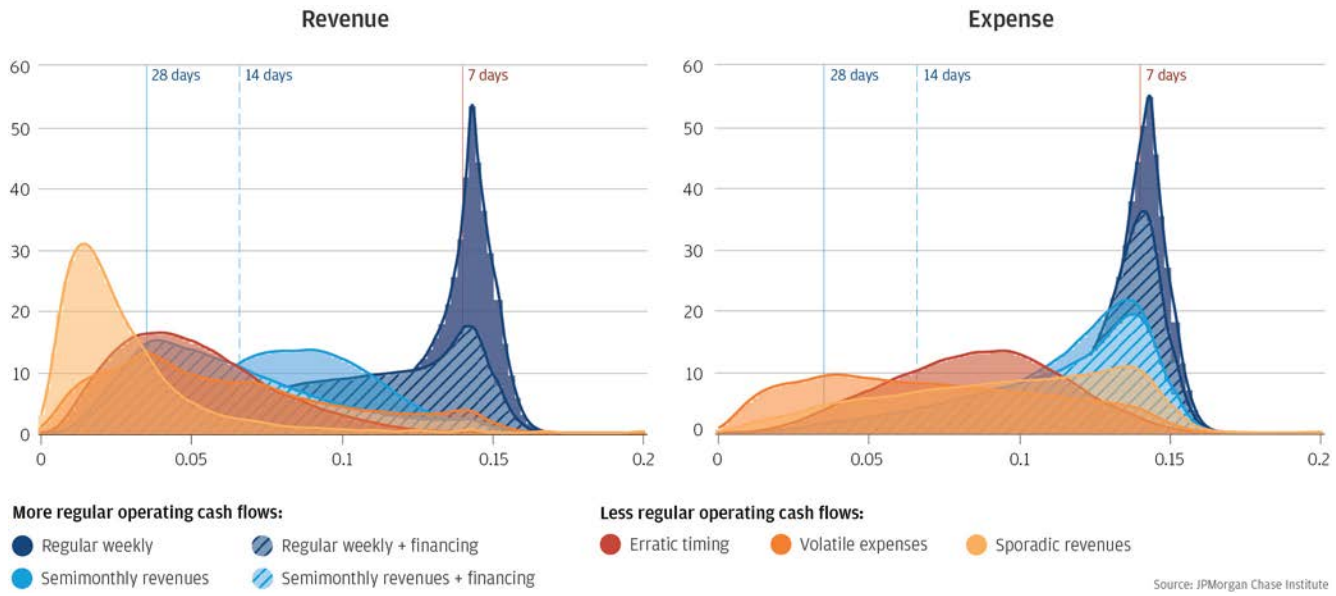


Figure A3. Distribution of consistency of timing across seven cash flow patterns

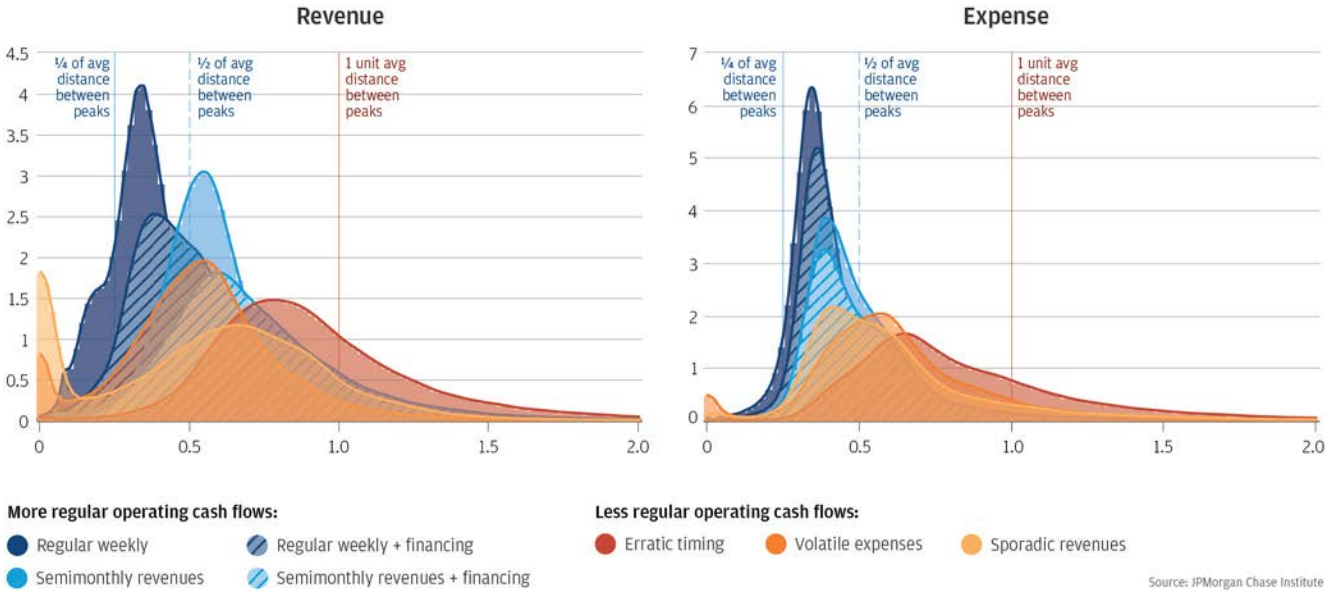
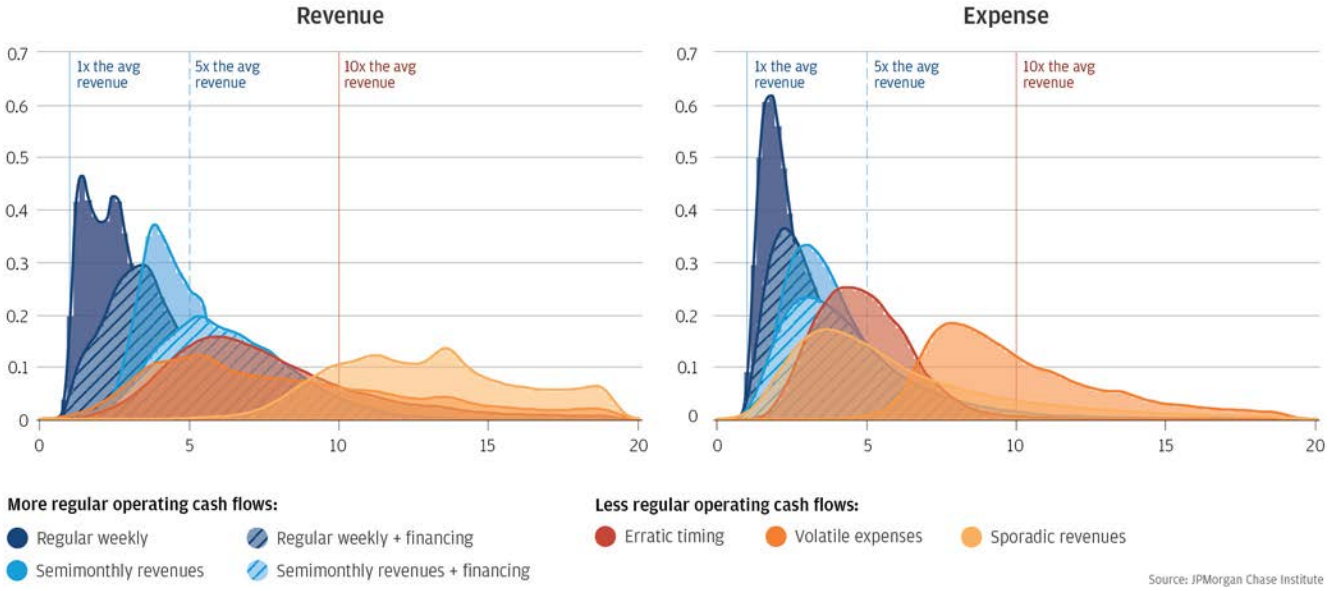


Figure A4. Distribution of volatility across seven cash flow patterns



- **Robustness checks** – Our final cluster analysis used seven clusters. K-means is an algorithm where the number of clusters is an input to the model, and there is no precise methodology to determine the number of clusters. It depends strongly in the objective of the clustering exercise and the underlying structure of the data. In order to determine the number of clusters, we followed an ad hoc methodology in which we were trying to find the number of clusters that maximized the differences between clusters with the lowest and highest exit rates. The goal of this exercise was to use cash flow patterns to gain a better lens on small business performance. With this in mind, we iterated from two to 12 clusters and determined that seven clusters created the largest differences between our patterns.

Training a predictive model – The last step in the cash flow pattern methodology was to train a predictive model to assign a cluster to observations that were not part of the training dataset. The objective was to create a model that predicted the cluster of any small business using one year of daily revenues, daily expenses, and financing utilization. K-means is an inherently unstable algorithm, so our goal was to generate a model that had greater consistency and accuracy at predicting our newly assigned clusters. We used Gradient Boosting, a classifier that has shown great performance in other classification exercises. To train the predictive model, we followed a standard machine learning approach in which we split our dataset between training, testing, and validation sets. Our features were the same dimensions used to train k-means, and our truth set was the cluster assigned to each firm. We tuned the parameters of the model using the testing set and finally used the validation set to verify the accuracy of the model.

Using this method, we achieved 99 percent accuracy in predicting the correct cluster for our out-of-sample set, so we used this model as the tool to determine the cash flow pattern of small businesses in our 2013 cohort for Findings 4 and 5.

Descriptive statistics – Figures A5 and A6 present descriptive statistics for our small business segments and cash flow patterns.

Figure A5. Cash flow summary characteristics by small business segment

	Median year 4 revenue	Median annualized revenue growth	Median year 4 expenses	Median annualized expense growth	Median year 4 financing inflows	Median financing utilization
Financed growth, declining	$102,000	-57.7%	$214,000	-43.7%	$200,000	61.8%
Financed growth, growing	$1,294,000	33.2%	$1,165,000	12.2%	$687,000	33.8%
Organic growth, declining	$8,000	-78.1%	$11,000	-60.2%	$2,000	26.1%
Organic growth, growing	$202,000	41.1%	$142,000	39.0%	$8,000	4.2%
Stable micro	$93,000	2.0%	$66,000	2.9%	$3,000	3.0%
Stable small employer	$761,000	3.0%	$654,000	3.2%	$21,000	3.1%

Source: JPMorgan Chase Institute

Figure A6. Cash flow summary characteristics by cash flow pattern

	Median volatility (× daily average)		Median frequency (days)		Median consistency (% deviation from frequency)		Median financing utilization (% of inflows)
	Expenses	Revenue	Expenses	Revenue	Expenses	Revenue	
Regular weekly	2.04	2.21	7.1	7.1	34.6%	33.0%	1.3%
Regular weekly + financing	2.80	3.45	7.4	8.7	38.3%	45.2%	30.5%
Semimonthly revenues	3.45	4.38	8.1	12.2	44.7%	54.9%	0.7%
Semimonthly revenues + financing	3.89	5.96	8.3	17.7	45.9%	66.2%	63.1%
Erratic timing	4.75	6.89	11.6	21.2	75.3%	85.9%	3.9%
Volatile expenses	9.29	7.19	15.1	18.7	58.1%	52.9%	3.3%
Sporadic revenues	5.00	12.82	10.2	47.4	53.7%	58.1%	87.6%

Note: Frequency, as given by the formula in this appendix and graphed in Figure A2, is the inverse of the average number of days between local peaks in cash flows. For ease of interpretation, the median frequency shown in this table is the average number of days between peaks.

Source: JPMorgan Chase Institute

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Glossary

Business dynamism Economic vitality resulting from the reallocation of resources from exiting or less successful firms, with declining revenues, to new or more successful firms, with growing revenues.

Consistency (of timing) Standard deviation of the number of days between local peaks in cash flows, divided by the average number of days between local peaks. Higher values of this measure indicate larger deviations in timing relative to the average timing of peak cash flows.

Employer A firm that had payroll outflows in at least six out of the past 12 months.

Exit A firm's closing 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.

Financed growth firms, growing Financed growth firms that have positive revenue growth between their first and last years.

Financed growth firms, declining Financed growth firms that have negative revenue growth between their first and last years.

Firm Our unit of analysis, one or more Chase Business Banking accounts identified as related businesses.

Frequency 1/the average period, in days, between local peaks in cash flows. Larger values of frequency indicate higher frequency occurrences (e.g., weekly).

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.

Organic growth firms, growing Organic growth firms with average annual revenue growth of at least 20 percent.

Organic growth firms, declining Organic growth firms with average annual revenue decline of at least 20 percent.

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.

Volatility Standard deviation of cash flow, divided by the average daily cash flow. Higher values indicate larger deviations in amount relative to the daily average.

Endnotes

1 The 2014 Census Bureau Annual Survey of Entrepreneurs data show that, among small employer businesses, smaller businesses are more likely to be owned by women and minorities than larger businesses. For example, 2.2 percent of business with one to four employees were Black-owned, while only 1.3 percent of businesses with 100-499 employees were Black-owned. Likewise, 21 percent of business with one to four employees were women-owned, while only 8.7 percent of businesses with 100-499 employees were women-owned. See https://www.jpmorganchase.com/corporate/institute/small-business-ownership.htm for additional statistics.

2 For instance, the Federal Reserve Small Business Credit Surveys found that in 2015, 40 percent of employer firms applied for financing in the past 12 months, of which 48 percent received all of the financing they sought. Only 32 percent of nonemployer firms applied for financing, of which 29 percent received all of the financing they sought. https://www.fedsmallbusiness.org/medialibrary/fedsmallbusiness/files/2018/sbcs-employer-firms-report.pdf; https://www.newyorkfed.org/medialibrary/media/smallbusiness/2015/Report-SBCS-2015-Nonemployer-Firms.pdf

3 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.

4 In addition to Shane (2012), the US Census Bureau reports $32.5 trillion in total business receipts and $1.03 trillion in nonemployer receipts in 2012, the most recent year for which receipts data is available for all businesses. The IRS 2012 Statistics of Income also report $1.30 trillion in income for non-farm sole proprietors.

5 Age is also an important primary distinction for policy and decision makers to attend to. However, our data asset in this study provides the sharpest lens on small businesses aged four years or less, where we can observe their entire financial history.

6 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 $3.3 million 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.

7 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 10 employees.

8 For example, cities are competing to be the site of Amazon's second headquarters, hoping that it will be the beginning of a technology hub in their cities. Atlanta has touted the benefits to small business if it were to be selected. https://www.myasbn.com/small-business/business-news-trends/three-benefits-amazons-hq2-atlantas-small-business-community/

9 When Google chose Alabama as the site of a data center, policy makers hoped that it would bring other technology companies to the area as well: "Although Google won't initially be a major employer in Jackson County, state and local officials said they hope to decision by Google to locate in Northeast Alabama will spur other technology companies to consider the area." http://www.timesfreepress.com/news/breakingnews/story/2018/apr/09/google-building-600-million-data-center/467903/

10 The Massachusetts Life Sciences Center is statewide initiative to incentivize the biotech industry. https://www.bizjournals.com/boston/news/2017/06/19/baker-vows-500m-to-extend-life-sciences-push.html

11 The Just Add One Initiative seeks to provide "tools, strategies, and solutions" to small business owners to support them in adding just one additional employee. See http://workforceinvestmentworks.com/jao/about.asp

12 The "One in Three" initiative suggests that unemployment could be meaningfully addressed if just one in three microbusinesses were able to add a single employee. See https://aeoworks.org/pdf/one_in_three.pdf

13 By way of comparison, Fairlie et al. (2016) find that 1.9 percent of firms that started as nonemployers hired their first employee 1 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. 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.

14 In the sample produced by the sample criteria used in the original Cash is King report, we reported that the median small business in our sample carried 27 cash buffer days. We have subsequently refined and revised our sample criteria. The median small business in our current sample carried 12 cash buffer days in 2016.

15 For example, policy discussions regarding health insurance often consider effects on small employer firms purchasing coverage for their employees. However, small business owners without access to group coverage are often overlooked. They are neither served by programs for small employers (because they have no employees) nor by subsidies for individuals (because they typically exceed income thresholds).

Suggested Citation

Farrell, Diana, Christopher Wheat, and Chi Mac. 2018. "Growth, Vitality, and Cash Flows: High-Frequency Evidence from 1 Million Small Businesses." JPMorgan Chase Institute.

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