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Gender, Age, and Small Business Financial Outcomes

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

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Executive Summary

The small business sector, comprised of businesses with fewer than 500 employees, makes substantial contributions to overall US economic growth and dynamism. That dynamism is driven by the people who start businesses and grow them, including women who now comprise 36 percent of business owners, up from just 4.6 percent in 1972, and the business owners aged 35-54 who start and own the majority of firms. Understanding their experiences is critical to understanding the financial health of the small business sector.

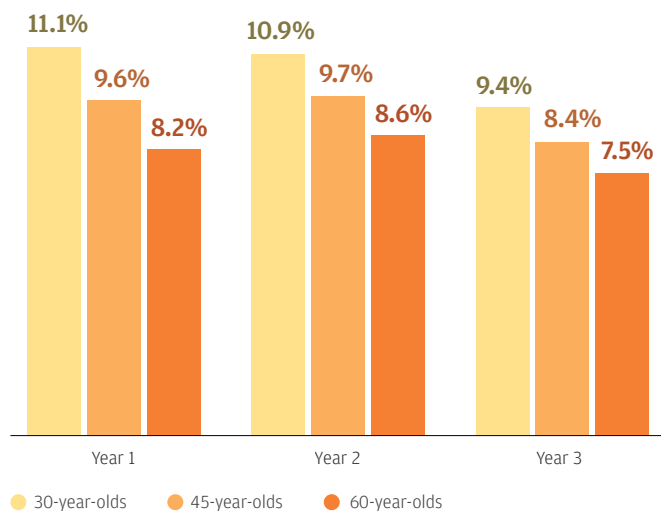
This report focuses on small business financial performance, with a specific emphasis on differences in outcomes by owner age and gender. We leveraged unique, high-frequency transaction data from a sample of 1.3 million small operating businesses to provide insights into small business financial health and performance, including survival, cash liquidity, revenues, and revenue growth.

Our findings are four-fold:

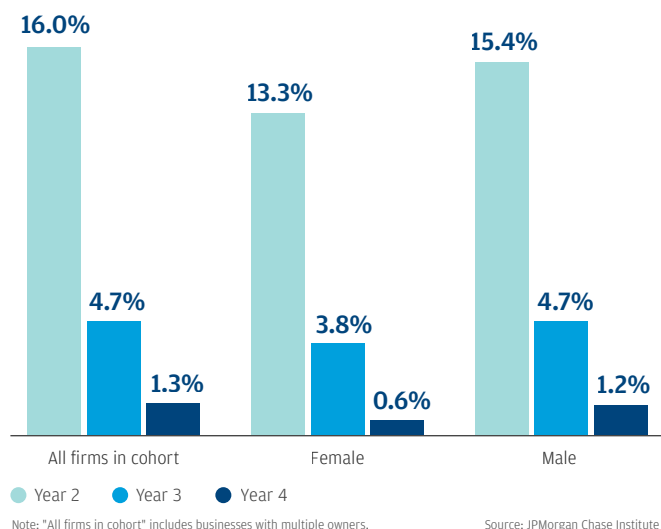
- **Finding 1:** Young and female small business owners are well-represented among firms that grow organically, but underrepresented among firms with external financing.
- **Finding 2:** Firms with founders 55 and older are the most likely to survive but are the least likely to have employees.
- **Finding 3:** Female-owned firms start with revenues levels 34 percent lower than male-owned firms and have slower revenue growth.
- **Finding 4:** New female-owned businesses have 46 percent of the revenues of new male-owned businesses in San Antonio, but 85 percent of the revenues of male-owned businesses in Miami.

Small business survival alone does not necessarily ensure revenue growth, effective cash flow management, or other indicators of financial health. Young business owners start one third of new firms, and these firms grow quickly if they survive. New firms founded by older business owners are more likely to survive, but they may not be as dynamic: they grow more slowly and are the least likely to hire employees. Women start firms that have 34 percent lower revenues and grow more slowly than those started by men, but these firms are just as likely to survive.

Predicted probabilities of firm exit, by age of founder



Median within-firm revenue growth during first four years



Introduction

The 30 million small businesses in the United States are often heralded for the outsized impact they have on the US economy: firms with fewer than 500 employees make up more than 99 percent of all businesses in the country, produce almost half of GDP, and create 65 percent of new jobs.¹ Moreover, the sector has the potential to impact the lives of small businesses owners who are inextricably linked with their businesses. The overwhelming majority of small businesses (80 percent) have no employees at all, and only 7 percent have five or more employees.² While the potential for economic impact is impressive, it obscures the lived experience of the typical small business owner, who saw little if any revenue growth in recent years—at most just 1.8 percent, according to our data.³ Given the sheer number of small businesses, even a very small increase in revenue growth rates could have a large effect on the economy and improve the financial wellbeing of millions of small business owners.

While the small business sector has the potential to drive both aggregate and broad-based economic growth, its heterogeneity can present challenges to policy makers. Differences in industry, firm age, employer status, and other factors could all affect firm growth trajectories and influence which policy levers to pull for maximum impact. Of particular interest among policy makers and small business advocates is how the gender and age of small business owners affects firm financial health, and what policies might allow small businesses owned by women or young people to make more substantial contributions to overall economic growth. Such interest is well founded. While women's participation as small business owners has grown from just 4.6 percent in 1972 to 36 percent in 2014,⁴ they do not own a representative share of small businesses. Some observers of the US economy have expressed concern that the number of younger people starting businesses has declined in recent years (Kauffman Index of Startup Activity, 2017).

Do women, young people, or older business owners make different decisions about how to finance their businesses and whether to hire employees? What relationships exist between those decisions and firm growth rates or revenues? Answers to these questions could help advocates develop more effective programs or policies to benefit small business owners as well as determine if existing targeted programs are achieving better business outcomes.⁵

With these questions in mind, the JPMorgan Chase Institute examined its small business data asset based on de-identified financial data from 1.3 million small operating businesses that use Chase Business Banking deposit accounts. We analyzed the 3.1 billion transactions associated with these accounts with a specific focus on gender and age as they relate to prevalence, firm size, cash flow, growth, longevity, and other factors. This asset includes a cohort of 138,000 firms founded in 2013, which we could observe over time to determine the longitudinal influence of owner gender and age on the early years of a business.

We found that the typical trajectory of small business outcomes differs for each of the demographic categories we analyzed. Women, for instance, launch about 30 percent of firms, which start smaller and grow more slowly than firms owned by men, but have similar survival prospects as their male-owned counterparts. Young people under the age of 35 start about one third of new firms, but their businesses tend to exit more quickly than small businesses with older owners. Those that do stay in business are more likely to grow more quickly and achieve smoother cash flow patterns compared to older owners.

Data Asset

Our sample consists of 1.3 million small operating businesses in metropolitan areas. These firms have Chase Business Banking deposit accounts that were active between October 2012 and February 2018. We also identified a cohort of 138,000 firms founded in 2013, which allows us to compare firms of similar maturity and track their outcomes over time. The appendix provides additional details about the process used to construct these samples.

Our sample is based on business deposit accounts and not on employment records,⁶ which allows our data to provide insights on the vast majority of small businesses that do not have paid employees. The firms in our sample are nevertheless sufficiently formal to have business banking accounts. We do not capture informal businesses that operate only through cash or personal deposit accounts.

This report focuses on two business owner characteristics: gender and age. While we do not observe legal ownership shares, we do observe one or more natural persons linked to business banking accounts. Through this view, a firm can have more than one owner, and most multi-owner firms have two owners. (See Box 1 for details about multi-owner firms.) To simplify the analysis of business outcomes by owner gender, we limited the sample for these analyses to firms with one owner. Gender could not be determined for over a third of our cohort sample, and those firms were excluded from the gender analyses. (Box 2 summarizes the characteristics for firms with unknown gender.)

In our analyses of business outcomes by owner age, we used the youngest owner's age when there were multiple owners, which allows us to address research questions about the prevalence of young business owners. Our results are not sensitive to this age assumption. We were able to identify owner age for nearly all firms in our sample.

Box 1: Small businesses with multiple owners

In our cohort of approximately 138,000 firms founded in 2013, 23 percent had more than one owner. Out of the firms with more than one owner, 86 percent had two owners and the remainder had three or more owners.

The overall gender composition could not be determined for 62 percent of multiple owner firms (e.g., only one of the two owners had known gender). Among multiple owner firms where gender composition could be determined, 9 percent were majority female-owned (i.e., women comprised more than 50 percent of owners), 41 percent were majority male-owned, and the remaining 50 percent were owned equally by men and women. All analyses of business owner genders in this report is conducted on a sub-sample of firms owned by one woman or one man.

Firms with young owners are more likely to have more than one owner. In our cohort, 30 percent of firms with owners under age 35 had multiple owners, compared to 22 percent of firms with owners between 35 and 54 and 15 percent of firms with owners aged 55 and over. Among firms with multiple owners, the median age difference between the oldest and the youngest owner was four years.

Box 2: Classification of small business owners by gender

Gender could be determined for 64 percent of the single-owner firms in the 2013 cohort, leaving 36 percent with unidentified gender. In this group with unknown gender, 17 percent were in retail, 15 percent were in construction, and another 13 percent were in other professional services. Since women are more likely to own retail businesses, and men are more likely to own construction businesses, it is difficult to ascertain whether this group would have a larger share of female-owned firms than the group of firms for which gender could be determined.

Small businesses with owners of unknown gender appear to have distinct operating characteristics. Thirty-nine percent of the 2013 cohort does not survive four years, compared to about 30 percent of those owned by a man or a woman. The median first-year revenues for this group is \$70,000, about 40 percent higher than female-owned firms and 7 percent lower than male-owned firms. Firms in this group also exhibit higher revenue growth rates than female-owned firms and very similar to male-owned firms, with a median of 15.9 percent in the second year and 4.9 percent in the third year.

Our analyses of small business owners' gender exclude firms where the gender of the owner is unknown. However, these firms are included in our analyses of owner ages.

Small Business Owner Gender and Age Distributions

Small business ownership varies by both gender and age. Moreover, the distribution of owners that start new firms in each year can differ from the distribution of owners of all firms operating in each year. Founders under the age of 35, most of whom are part of the millennial generation, started about one third of new firms between 2013 and 2017,⁷ and their share of the total number of new firms increased slightly over this period, as shown in Figure 1. The share of new firms started by younger owners is proportional to their 30 percent share of the adult population during this period.⁸

One advantage of our data is that it illustrates the dynamics of small business ownership over time. In particular, the share of new firms started by young founders is substantially larger than the share of all firms owned by younger owners in any given year, which was between 13 percent and 19 percent.

The difference between the share of young founders and the share of young owners offers perspective on previous research showing that millennials are less likely to be self-employed than members of previous generations. Wilmoth (2016) found that less than 4 percent of millennials at age 30 were self-employed, compared to 5.4 percent for Generation X, and 6.7 percent for baby boomers at the same age.⁹ Our data also suggest a comparatively low share of small business ownership among owners under 35, but illustrate that the share of younger small business founders is substantially higher than it might appear from observing the share of owners by age in any given year.

Figure 1 also shows that prime-aged business owners between the ages of 35 and 54 started and owned the majority of all firms. This is consistent with research showing that founders are typically in their 40s (Azoulay et al., 2018). Business owners aged 55 and over start about 15 percent of new firms but own up to a third of all firms.

Some of the difference between the age distribution of founders of new firms and that of all firms is related to the fact that business owners mature along with their firms, and thus young founders become prime-aged business owners, and prime-aged small business founders become older business owners over time. The difference also reflects lower survival rates for younger small business owners, which we explore further in Finding Two.

Women founded between 29 percent and 32 percent of new firms in each year. Women also owned about the same share of all firms during this period, as shown in Figure 2. Due to methodological differences (see Boxes 1 and 2), these shares are lower than some benchmarks, which estimate that female-owned businesses comprise 36 percent of firms (McManus, 2017). Other studies found that 20 percent of small employer firms are majority female-owned (Federal Reserve, 2017b). Our results are consistent with other estimates in which women own a minority of businesses.

Figure 1: Age distributions of small business owners

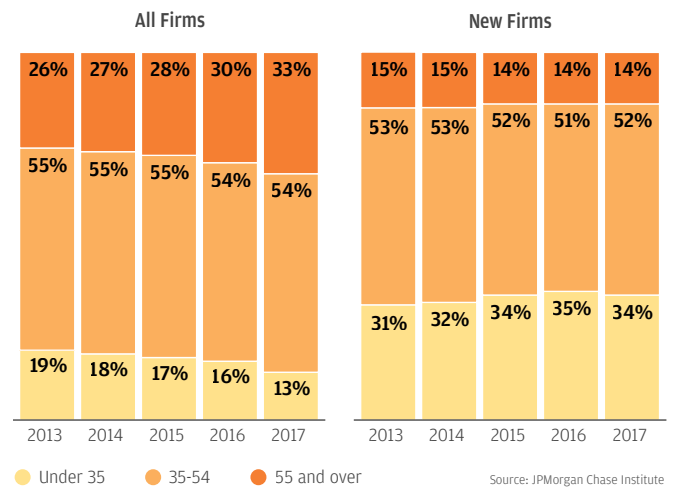
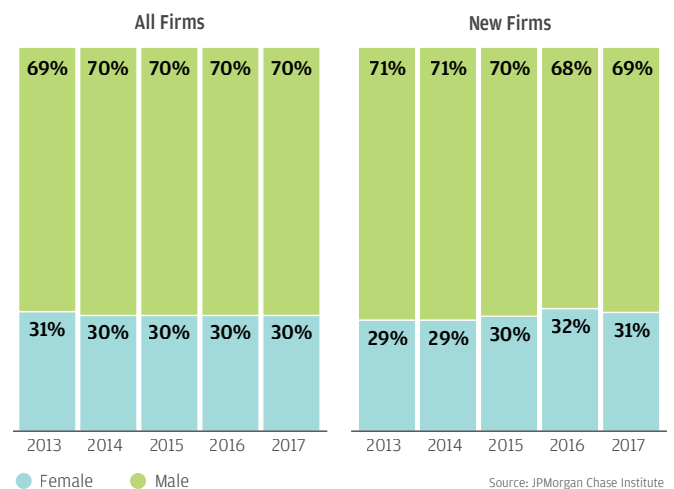
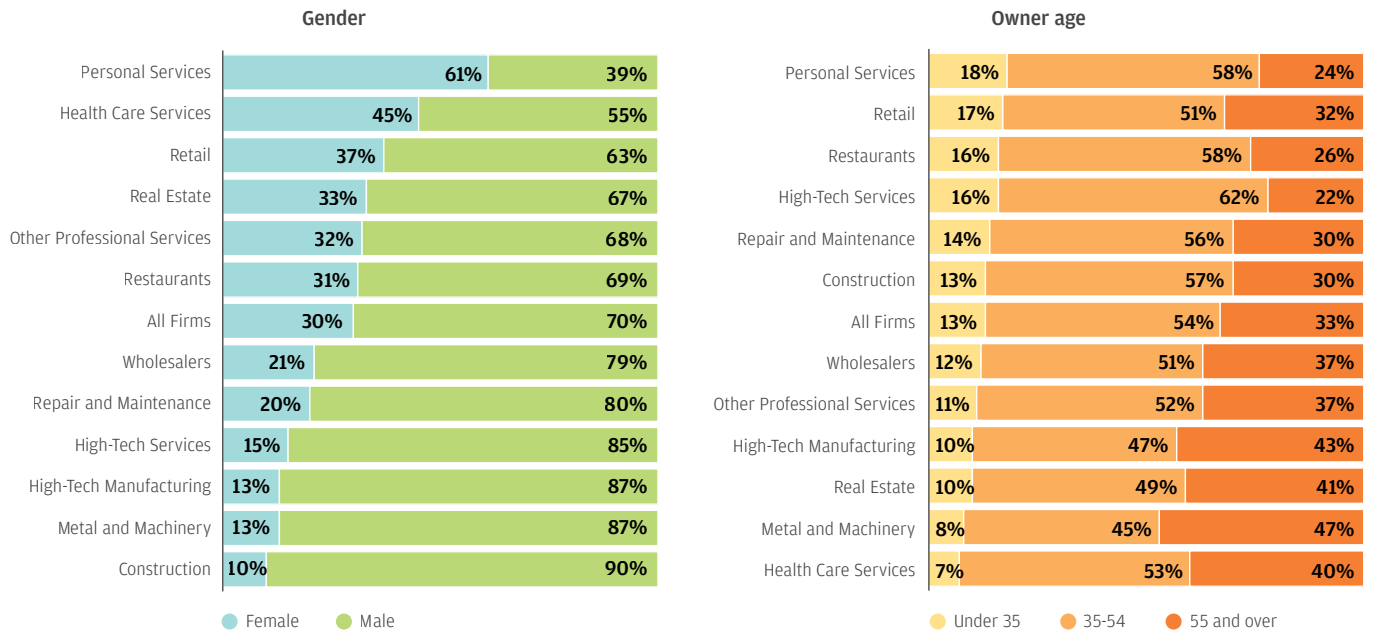


Figure 2: Gender distributions of small business owners



We also find substantial differences in the gender and age of owners by industry. Figure 3 shows ownership across industries in 2017 based on owner gender and age. The left panel shows the gender breakdown for firms with one owner, and the right shows the owner age breakdown for all firms. Women were more likely than men to own small businesses in service industries, owning over half of the small businesses in personal services, as well as a large share of firms in health care services and retail. Men, in contrast, dominated the construction, metal and machinery, and high-tech manufacturing industries.

Figure 3: Gender and age distributions by industry, 2017



Source: JPMorgan Chase Institute

Younger business owners were more likely to operate firms in personal services, retail, and restaurants. The top three industries with the largest shares of business owners aged 55 and over are metal and machinery, high-tech manufacturing, and real estate—all industries that are more capital intensive. Below, we explore the relationship between owner demographics, industry, and business outcomes.

Findings

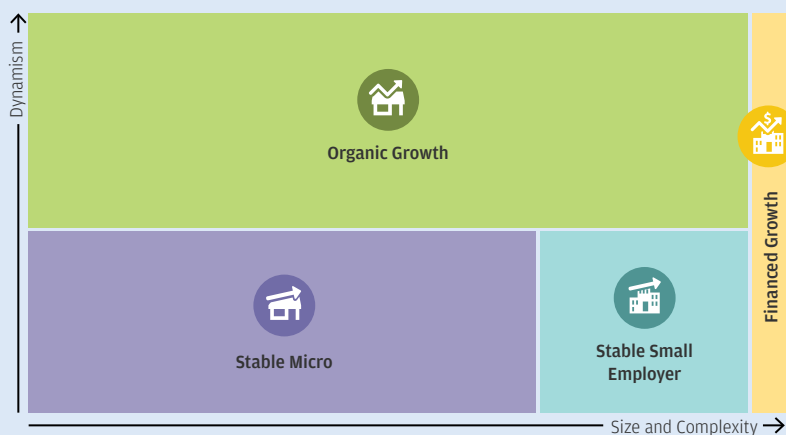
Finding One

Young and female small business owners are well-represented among firms that grow organically, but underrepresented among firms with external financing.

In a prior study, we introduced a new segmentation of the small business sector which highlighted the variations in dynamism, size, and complexity exhibited by small businesses (see Box 3). One of insights from this analysis was that many firms grow organically rather than through external finance—after four years, these organic growth firms generated the majority of the cohort’s aggregate revenues and payroll (Farrell et al., 2018).

Box 3: A segmentation of the small business sector

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



Source: JPMorgan Chase Institute

Financed growth - These firms engage in financial behaviors consistent with the intention to make early investments in assets that would serve as the basis for a scale-based competitive advantage (e.g., investments in technology, brand, learning curve, or customer networks). Specifically, we identify a firm as a member of the financed growth segment if it has at least \$400,000 in financing cash inflows during its first year—a level consistent with financing amounts used by small businesses that take in investment capital.¹⁰

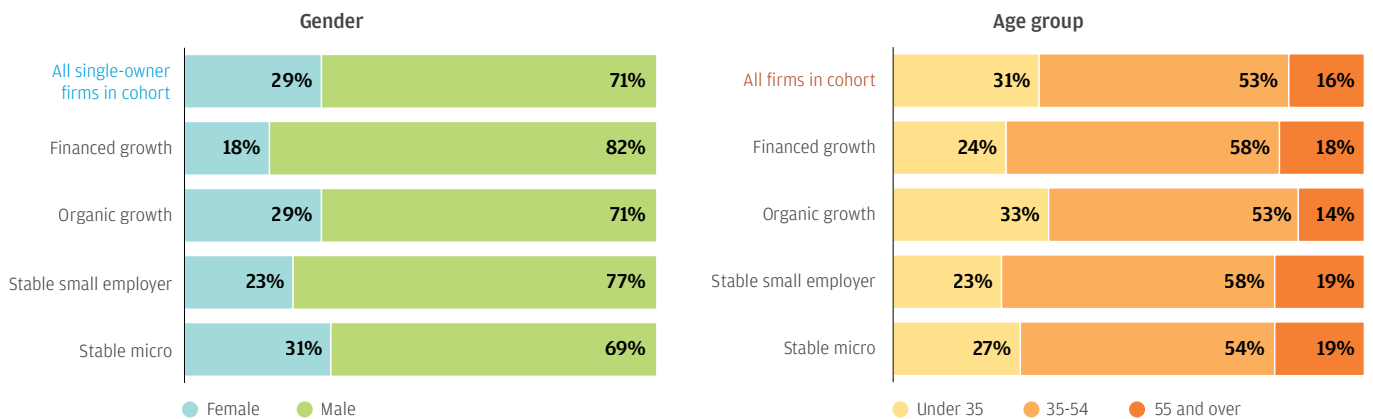
Organic growth - Firms in this segment also have growth intentions, but they primarily attain that growth organically out of operating profits rather than through the use of external financing. In order to capture both firms that intend to grow and succeed and those that intend to grow but fail, we leverage *post hoc* observations of revenue growth and define this segment as those firms with less than \$400,000 in financing cash inflows in their first year that either achieve average revenue growth of at least 20 percent per year from their first year to their fourth year, or those that see revenue declines of at least 20 percent per year. We also include firms that exit prior to four years that average above 20 percent revenue growth or 20 percent revenue declines per year prior to exit.

Stable small employer – Firms in this segment are less dynamic: they are in neither the financed growth nor the organic growth segments and likely have a stable growth strategy and a business model premised on the employment of others. We define stable small employers as those firms that have electronic payroll outflows in six months or more of their first year. To capture larger small employers who do not use electronic payroll, we also include firms that have over \$500,000 in expenses in their first year—approximately equivalent to payroll expenses for ten employees—in this segment.¹¹

Stable micro – Firms in this segment have either no or very few employees and do not exhibit behaviors consistent with growth intentions. We define the stable micro segment as containing those businesses that do not have electronic payroll outflows for six months of their first year and have less than \$500,000 in expenses.

Figure 4 shows the owner gender and age composition of each of these key small business segments for firms founded in 2013. Twenty-nine percent of firms in the cohort were founded by one woman, compared to 71 percent which were founded by one man. The same gender composition is evident in the organic growth segment. Relative to their share in the cohort, female-owned firms were underrepresented in the financed growth and stable small employer segments.

Figure 4: Gender and age distributions by small business segment



Source: JPMorgan Chase Institute

Younger owners, under age 35, founded 31 percent of new firms in 2013 and comprised about one third of organic growth firms, suggesting that this group is well-represented in this dynamic segment. However, young owners are underrepresented in the other segments, including stable small employer and financed growth.

Owners aged 35 to 54 founded 53 percent of firms in our cohort. These prime working-age individuals are materially overrepresented among small business founders, given that they represented only 35 percent of the adult civilian noninstitutional population in 2013. In contrast, older business owners, 55 and over, founded 15 percent of firms but comprised 35 percent of adults. Notably, firms owned by older owners made up 18 percent of financed growth firms. They were also more likely to be in the stable small employer and stable micro segments.

The segmentation combines several firm characteristics into a profile that reflects small business outcomes. The characteristics of owners supplement this perspective. In the subsequent findings, we examine more specific aspects of business outcomes and their relationship to owner age and gender.

**Finding
Two**

Firms with founders 55 and older are the most likely to survive but are the least likely to have employees.

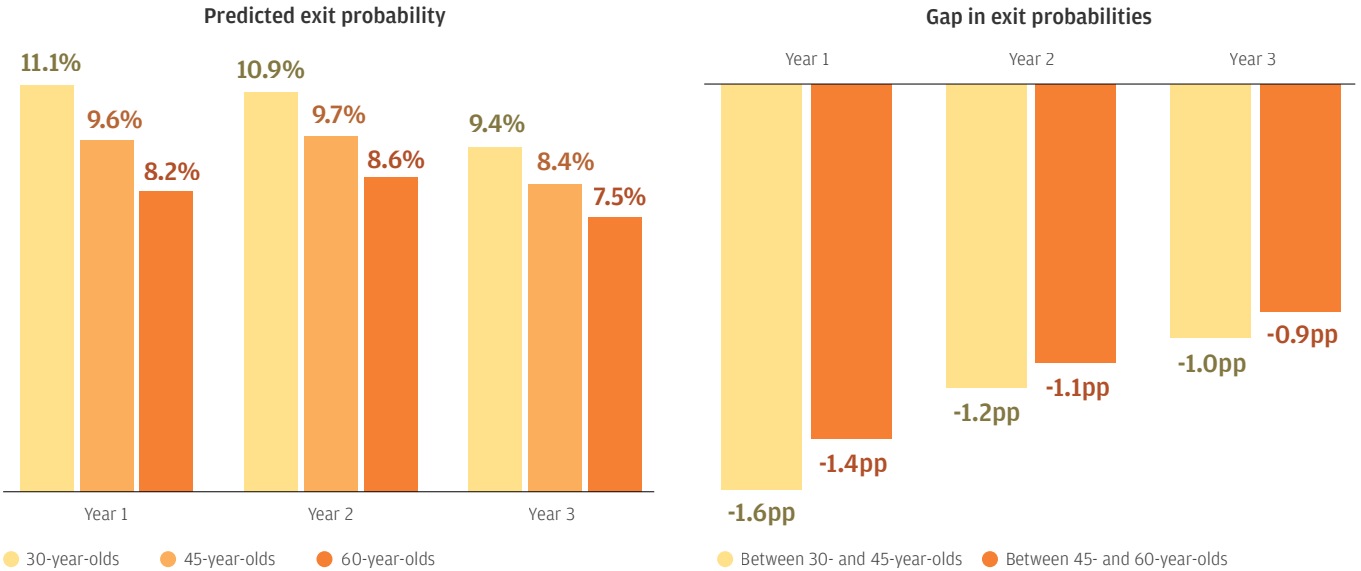
The exit of existing firms is an important part of business dynamism, since resources devoted to failing firms can be reallocated to new firms. However, survival alone does not guarantee that a firm will achieve other favorable outcomes such as hiring employees or achieving more regular cash flows. Indeed, we find nonintuitive connections between age, gender, and firm survival, regular cash flows, and hiring.

We estimated the probability of firm exit during the critical early years, as exit rates typically decline as firms mature.¹² Our models estimated the effect of owner gender and age on the likelihood of exit in the next year while controlling for other firm characteristics, such as employer status and industry (see appendix for regression results). We found that older founders in our sample have the highest survival rates. This may be because older founders could have a longer history of prior work experience, and such experience can help them survive the critical early years. Moreover, older founders may also have a network of potential clients or personal assets that could provide initial funding or cash buffers.

Figure 5 compares the predicted exit probabilities of a hypothetical firm founded by a 30-, 45-, or 60-year-old. A typical firm founded by a 30-year-old has an 11.1 percent predicted probability of exiting after its first year. In comparison, the same firm founded by a 45-year-old has a 9.6 percent probability of exiting during that same time frame, and one founded by a 60-year-old has an 8.2 percent probability of doing so. In subsequent years, this gap diminishes but remains statistically significant.

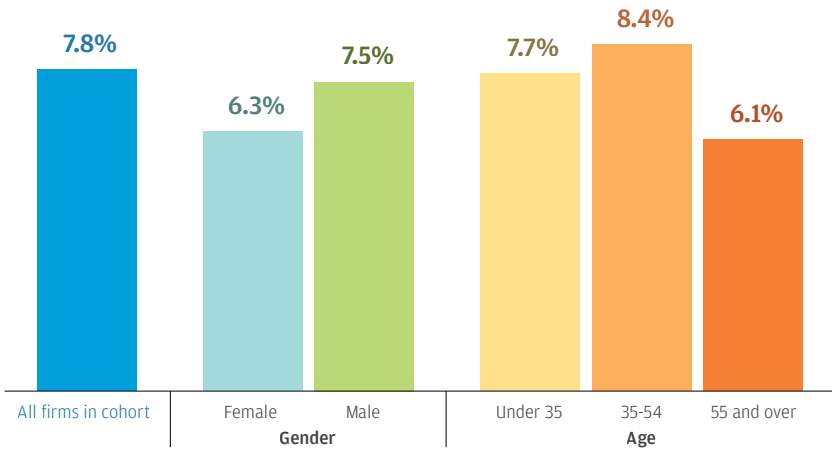
In contrast, we found no statistically significant difference in the probability of firm exit for a firm owned by a man compared to the same firm owned by a woman.

Figure 5: Predicted probabilities of firm exit within the next year, for a hypothetical firm founded by a 30-, 45-, and 60-year-old



Source: JPMorgan Chase Institute

Figure 6: Share of 2013 cohort that are employers in year 3



Note: "All firms in cohort" includes businesses with multiple owners.

Source: JPMorgan Chase Institute

Each of the explanatory variables in our model—employer status, the number of cash buffer days, and the cash flow pattern experienced during a year—not only helps explain exits but also describes other business outcomes.

For instance, employer firms typically exit less frequently than nonemployer firms (Farrell et al., 2018). However, Figure 6 shows that only 6 percent of firms with older owners were employers, nearly two percentage points lower than the share of employer firms in the cohort. Despite having the lowest share of employers, firms with owners 55 and over were the most likely to survive.

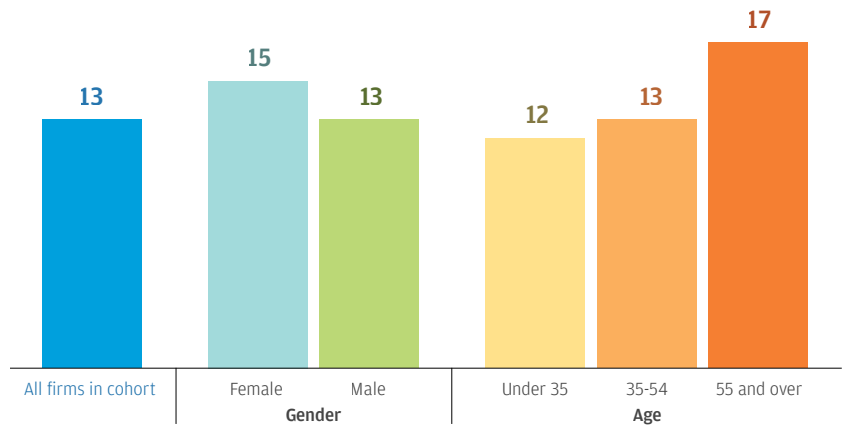
Cash buffer days—the number of days during which a firm could cover its typical outflows in the event of a total disruption to revenues—is another factor in firm survival, as it measures the ability of a small business to withstand emergencies using cash balances (Farrell and Wheat, 2016). In our regression results, one extra cash buffer day reduces the probability of exit the following year. The effect is small but statistically significant.

Figure 7 shows the median cash buffer days in the cohort’s third year of operations by demographic group. Female-owned firms typically held 15 cash buffer days, compared to 13 days for male-owned firms. Lower outflows or higher balances could result in more cash buffer days. Women have both lower outflows and lower balances, but they are nevertheless more conservative in maintaining their cash buffer.

Firms founded by owners 55 and older held 17 cash buffer days, compared to 12 days held by owners younger than 35. Older owners typically had balances of nearly \$5,600 and daily outflows of over \$300, while the under 35 group had balances of over \$4,000 and daily outflows of over \$300. Although older owners had similar outflows, they held more cash, and their larger cash buffers may help their firms survive.

Managing cash flows is also important to small business survival and growth. In the Survey of Business Owners, 20 percent cited cash flows among the reasons why their business ceased operations.¹³ We previously identified seven cash flow patterns (see Box 4), and showed that firms experiencing relatively irregular patterns exited at higher rates than those exhibiting more regular patterns, and that new firms either achieved more stable and regular cash flow patterns over time or exited (Farrell et al., 2018).

Figure 7: Median cash buffer days in year 3 for the 2013 cohort



Note: "All firms in cohort" includes businesses with multiple owners.

Source: JPMorgan Chase Institute

Box 4: Cash flow patterns

In order to describe empirically the cash flow management problems facing each small business, we developed measures to quantify the irregularity of revenues and expenses with respect to dollar amounts and timing and to gauge the use of financing. Using clustering techniques, we identified seven cash flow patterns experienced by small businesses. A firm can experience different patterns over the course of its lifecycle (Farrell et al., 2018).

The four more regular patterns:

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.

The three less regular patterns are each distinguished by particularly high irregularity in one area:

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.

Analyzing the interaction between cash flow patterns and owner demographics shows that in the first year, the distribution of cash flow patterns did not differ by either owner gender or age group: about 30 percent of firms experienced one of the three relatively irregular cash flow patterns. However, not every demographic group transitioned out of these irregular patterns at the same rate.

Although firms founded by older owners were more likely to survive four years, 41 percent of surviving firms did not transition from a more irregular cash flow pattern to a more regular one. In contrast, among firms with founders under the age of 35, less than 33 percent of surviving firms that had experienced irregular cash flow patterns in their first year were still in an irregular cash flow pattern in the fourth year.

An irregular cash flow pattern is not inherently worse than a more regular one, and such differences could simply reflect the types of small businesses older owners start. However, it could also be that older owners are more able to use personal assets to smooth irregular cash flows during the initial years. There were no differences in the transitions from irregular to more regular cash flow patterns between firms owned by men and women.

Figure 8: Share of surviving firms that continue to have irregular cash flow patterns in year 4



Source: JPMorgan Chase Institute

Finding Three

Female-owned firms start with revenue levels 34 percent lower than male-owned firms and have slower revenue growth.

The typical small business founded by a woman is smaller than one founded by a man, and that difference persists over time. Figure 9 shows that the median revenue in the first year was nearly \$50,000 for female-owned small businesses, compared to over \$75,000 for male-owned small businesses, a difference of 34 percent. This differential persists even as firms exit and surviving firms grow. In the fourth year, median revenues for a firm owned by a woman is almost \$68,000, compared to \$104,000 for one owned by a man.

The differences in median first-year revenues by age group were less pronounced. The typical firm founded by business owners 55 and over generated \$83,000 in first-year revenues, just 6 percent higher than first-year revenues of prime-age founded firms, and 24 percent higher than firms founded by young owners.

Revenue growth over time does not narrow the size gap between female- and male-owned firms. Figure 10 shows revenue growth rates for the 2013 cohort, by year of operations. For each demographic group, the percentage change in revenues from the first year to the second was greater than changes in subsequent years, suggesting that new firms see high initial growth followed by slower growth. However, these growth rates differ by demographic groups. Typical new firms founded by one woman grew 13.3 percent between the first and second year, compared to typical firms owned by one man, which grew at 15.4 percent. Firms founded by younger owners started smaller but grew faster than those of their older counterparts—24.7 percent for young owners compared to 6.7 percent for older business owners.

The different concentrations of female-owned firms by industry, as shown in Figure 3, might appear to offer an explanation for owner gender differences in median revenues. However, industry alone cannot explain the lower revenue levels of female-owned firms. Figure 11 illustrates the percentage differences in first-year median revenues by industry. For example, the typical restaurant founded by a woman had 38 percent lower revenues in the first-year than one founded by a man. The differential tended to be higher in service industries, such as health care services,¹⁴ and other sectors with large shares of female-owned firms, such as retail. In three male-dominated industries—high-tech manufacturing, construction, and metal and machinery—the relatively few female-owned firms had larger first-year median revenues than male-owned firms.

Figure 9: Median revenues for small businesses in the 2013 cohort, by gender and year

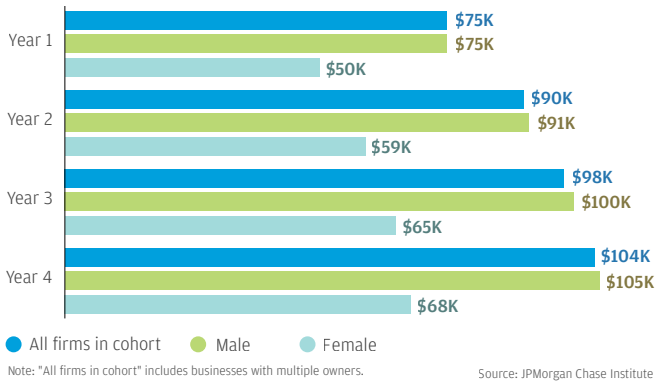


Figure 10: Median within-firm revenue growth, 2013 cohort

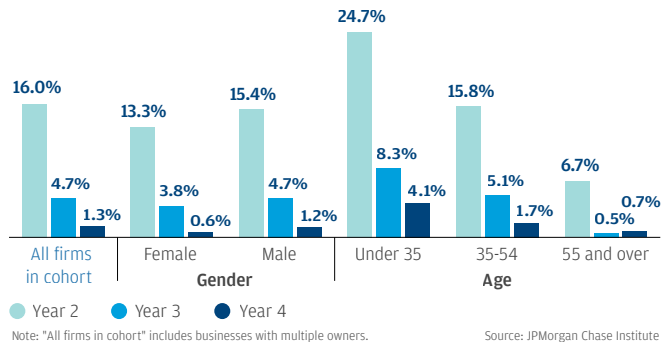


Figure 11: Gap in first-year median revenues between female- and male-owned firms, by industry

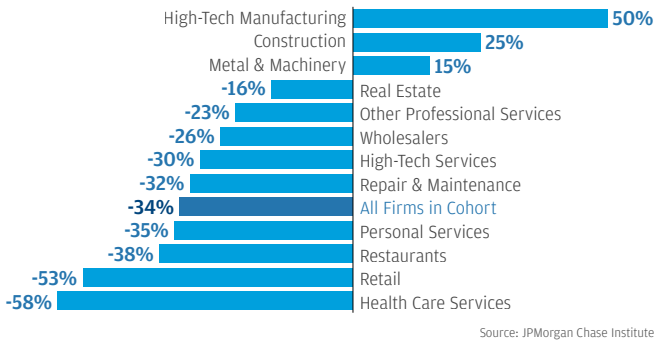


Figure 12: Median revenue in the first year, by age group and industry

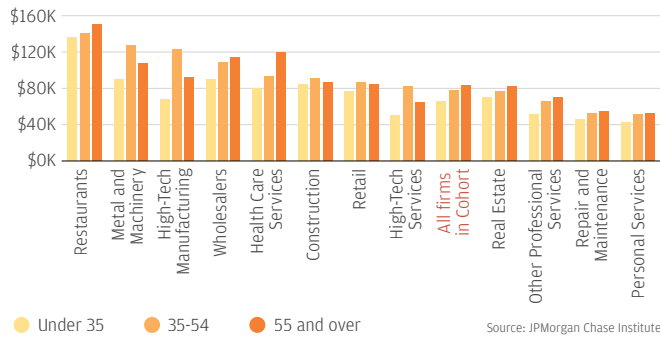
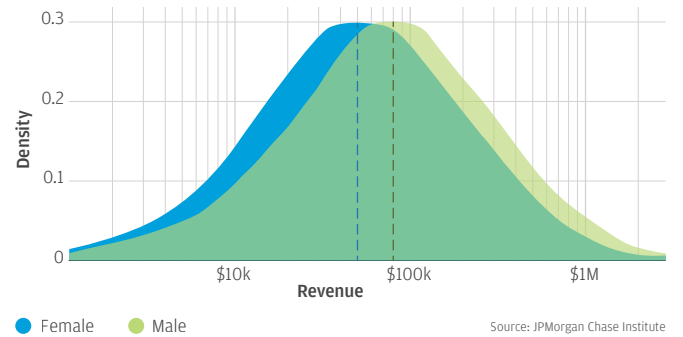


Figure 13: Distribution of first-year revenues for female- and male-owned small businesses



Firms with young owners under age 35 typically have lower first-year revenues than firms with older owners, but the difference is not always large. Figure 13 shows the median first-year revenues by industry and founder age group. Firms founded by older business owners, aged 55 and over, have the highest first-year revenues in most industries, but not high-tech services, high-tech manufacturing, or metal and machinery.

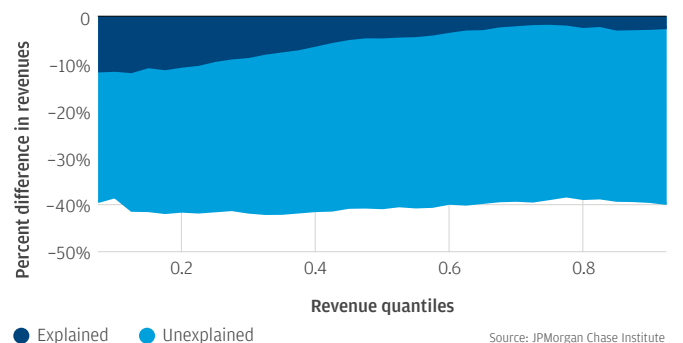
Given our finding that female-owned small businesses generate lower revenue levels than men in most industries, we wanted to explore how the combination of observable firm and owner characteristics affected firm revenue levels. To do so, we conducted a counterfactual analysis of first-year revenues for female-owned firms compared to male-owned firms, in order to estimate the revenues a female-owned firm would generate if it were owned by a man.

First we examined the distribution of revenues for female- and male-owned firms—this provides a more comprehensive view than medians. Figure 13 shows that the observed distribution of first-year revenues¹⁵ for female-owned firms lies to the left of the distribution for male-owned firms—the share of male-owned businesses with revenues in excess of any given dollar amount always exceeds the comparable share of female-owned businesses. For example, Figure 13 shows that 18 percent of male-owned firms had revenue exceeding \$150,000, while only 15 percent of female-owned firms had revenues greater than that level.

We then computed counterfactual revenues across the entire range of revenues. One advantage of this type of analysis is that it allows for the possibility of different gender effects for different revenue levels. The revenue differential between the smallest female- and male-owned firms may be wider or narrower than between the largest (see appendix for further details).

Figure 14 shows the percentage difference between first-year revenues of female-owned firms and male-owned firms across revenue quantiles. Each quantile represents an equally sized fraction of the revenue distribution, with revenue levels increasing as the quantile increases. Across quantiles, female-owned firms have first-year revenues that are around 40 percent lower than male-owned firms. Little of this difference can be explained by observable differences in firm or owner characteristics, including industry, employer status, owner age, or the presence of financing inflows. For high-revenue firms in the upper quantiles, these factors explain an even smaller portion of the revenue difference than they do for lower-revenue firms.

Figure 14: First-year revenue gap between female- and male-owned small businesses



Despite these revenue differentials, a small business founded by a woman is just as likely to survive as one founded by a man. There may be other firm and owner characteristics that are observable but not available in our dataset that may help explain the revenue and revenue growth differential. Owner characteristics such as race, education, and prior work experience, for example, could be important factors in business outcomes. Unobservable characteristics such as preferences for smaller firms could also be a factor. Nevertheless, our counterfactual analysis suggests that women may face different challenges starting and growing a business compared to men in the same industries.

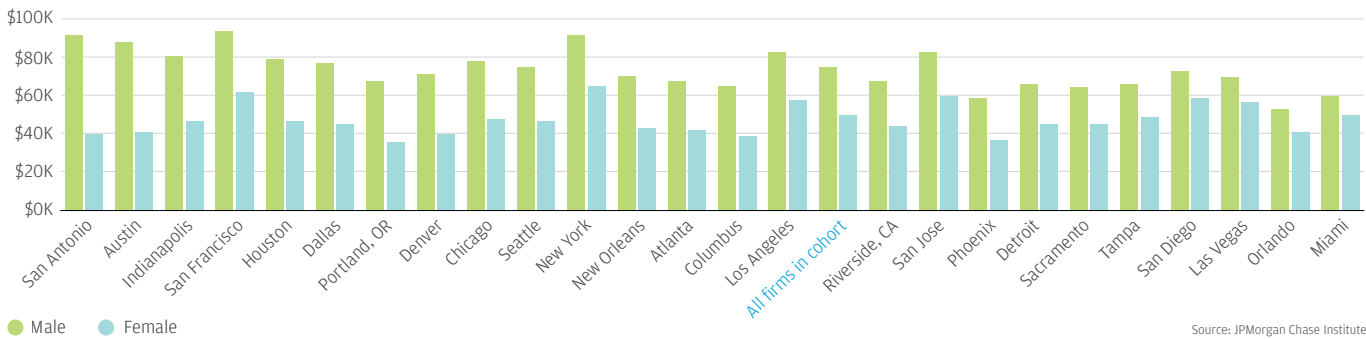
**Finding
Four**

New female-owned businesses have 46 percent of the revenues of new male-owned businesses in San Antonio, but 85 percent of the revenues of male-owned businesses in Miami.

The first three findings of this report describe the relationship between owner gender and age and small business outcomes, such as survival and growth. While these findings apply to small businesses nationwide, small business policies are often designed and implemented locally. Moreover, local policy makers may want to compare outcomes in their city to others, and to the nation as a whole. In prior research, we reported life expectancies of new businesses as well as the concentrations of organic growth and financed growth firms by metropolitan area (Farrell et al., 2018). First-year revenues by owner gender and age also vary by metropolitan area.

Female-owned firms generated median first-year revenues that were about 34 percent lower than median revenues of male-owned firms. Figure 15 shows that firms founded by women were smaller than firms founded by men in every metropolitan area, though the size differential varied by location. In San Antonio and Austin, small businesses founded by women were less than half the size of those founded by men, whereas firms founded by women in Miami typically had revenues that were 17 percent lower than male-owned firms in the first year—a difference of \$10,000.

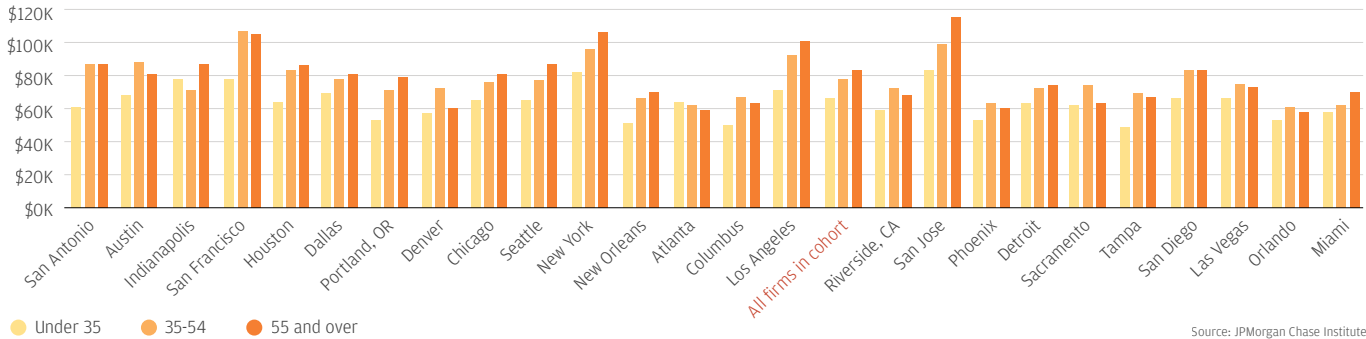
Figure 15: Median first-year revenues for female- and male-owned firms, by metro area



Source: JPMorgan Chase Institute

Figure 16 shows median first-year revenues by age group and metropolitan area. Young business owners under the age of 35 typically started smaller firms, though not in every city. For instance, businesses with younger owners in Indianapolis were 10 percent larger than businesses with prime-age owners, but smaller than firms with owners at least 55 years old. In many metropolitan areas, older business owners founded larger businesses than their younger counterparts, but not all metropolitan areas followed this pattern sharply. For example, firms founded by older owners in Denver and Sacramento are only slightly larger than those founded by the youngest group, while prime-aged business owners have the highest initial revenues.

Figure 16: Median first-year revenues, by age group and metro area



Source: JPMorgan Chase Institute

Conclusions and Implications

Few prior studies have been able to illustrate the wide diversity among small business owners in terms of the financial outcomes their small businesses achieve. Our unique administrative data add a missing piece in the search for answers to the larger question of what works to help small businesses grow and achieve financial stability. We find that gender and age differences among small business owners result in substantially different trajectories as they progress from firm creation to firm growth or exit. The effects of gender on small business financial outcomes are fundamentally different than the effects of age. While firms with younger owners grow rapidly but exit quickly, firms with female owners are stable but grow slowly. Given these different paths, we believe that policies and programs aimed at helping small business should likewise differ.

We offer the following implications for leaders and decision makers:

- **Policies that help women start larger businesses and grow their businesses could have a material impact on the US economy.** Female-owned businesses are just as likely to survive as male-owned businesses, but they start smaller and stay smaller due to lower revenue growth, resulting in lower relative impact on the economy. Tax expenditures that target industries in which women are underrepresented may in part explain the small size and slow growth of women-owned businesses (Bruckner, 2017). However industry participation, owner age, employer status, and use of financing explain only a small fraction of the gender gap, especially for higher-revenue firms. If female-owned businesses started with the same revenue levels as their male-owned counterparts and experienced the same levels of revenue growth, they would substantially increase the overall economic contributions of the small business sector to the US economy.
- **Prime-aged rather than young entrepreneurs start the businesses that are most likely to create jobs.** While declining rates of entrepreneurship among younger people are worthy of attention, new businesses are most often founded by people aged 35 to 54. These owners are likely to have more work experience in a variety of contexts, and possibly prior experience running small businesses. Moreover, firms with prime-aged founders are more likely to be employers than firms with younger or older founders. Policies such as health insurance and childcare that address the needs of small business owners in this age range may have ancillary benefits in small business job creation.
- **Young business owners make important contributions to business dynamism.** Business dynamism—the process by which new firms are founded, grow, and sometimes fail and release their resources—is important to overall economic growth (Decker et al., 2014, 2016; Hathaway and Litan, 2014; Economic Innovation Group, 2017). Businesses with young owners achieve faster revenue growth than those with older owners, even as they are more likely to exit. One possibility is that young owners fail more often because they lack experience. For them, investments in training programs could increase their ability to successfully grow their businesses. Moreover, student debt may limit the ability of younger business owners to build the liquidity needed to successfully grow their firms or otherwise manage cash flow challenges. While income-based repayment plans that reduce student loan payments may vary in their fiscal efficiency (Akers and Chingos, 2014), they could allow younger small business owners with student debt to operate small businesses with larger cash buffers.
- **A substantial share of business have older owners who may soon transition out of business ownership.** While business owners 55 and older own disproportionately few small businesses, they nevertheless comprised 33 percent of all firms in the sample in 2017, up from 26 percent in 2013. Although these businesses are less likely than those with younger owners to exit in a given year, their owners may need to sell these businesses as they reach retirement age. Policies that facilitate the transfer of businesses to new owners may enable these businesses to sustain their economic contribution to local communities.

Methodological Appendix

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Sample Construction

Full sample: We constructed a sample of 1.3 million firms that hold Chase Business Banking deposit accounts and meet our criteria for small operating businesses in core metropolitan areas. We then analyzed 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. The businesses in our sample:

- Held a Chase Business Banking accounts between October 2012 and February 2018
- Satisfied the following criteria for every month of at least one consecutive 12 month period:
 1. Held at most two business deposit accounts
 2. End-of-day combined balances never exceeded \$20 million
 3. Operated in one of the 12 industries that are characteristic of the small business sector: Construction, health care services, metals and machinery manufacturing, real estate, repair and maintenance, restaurants, retail, personal services (e.g., dry cleaning, beauty salons, etc.), other professional services (e.g., lawyers, accountants, consultants, marketing, media, and design), wholesalers, high-tech manufacturing, and high-tech services
 4. Operated in one of 386 metropolitan areas where Chase has a representative footprint
 5. Showed no evidence of operating in more than a single location or industry
- Satisfied 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:
 1. At least \$500 in outflows
 2. 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 the development and exists of 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 observed 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 were never considered employers and 86 percent never had an electronic payroll outflow. Details on how we identify payroll outflows are in our report on small business employment (Farrell and Wheat, 2017).

Regression Models

Firm exit: We used logistic regressions¹⁶ to estimate models of the probability of firm exit in the following year controlling for firm and owner characteristics of the current year. We estimated separate models for each of the first three years of operations for the 2013 cohort.

As Figure A1 shows, the coefficients on owner age in all three models were negative and statistically significant at the 1 percent significance level, indicating that older owners have significantly lower probabilities of exiting. The coefficient on the female indicator variable did not show a statistically significant difference in exit probabilities relative to male-owned firms.

Counterfactual analysis of first-year revenues: We estimated the counterfactual revenues a female-owned firm would earn if it were instead founded by a man using a technique described by Chernozhukov et al. (2013). Figure A2 shows the quantiles—40 groups based on first-year revenues—for both female- and male-owned small businesses. The observed distribution of revenues for female-owned firms (blue line) lies below that of firms owned by one man (green line), indicating that female-owned firms generated lower revenues across the distribution.

To compute the counterfactual revenues for female-owned firms, we first estimated regressions for each revenue quantile for male-owned firms. These regressions controlled for industry, employer status, owner age, and the presence of financing inflows. The female-owned firms’ counterfactual, represented by the dashed line in Figure A2, shows the distribution of revenues for female-owned firms if they were to earn the same level of revenues as male-owned firms with the same characteristics. For example, this counterfactual analysis estimates the revenues a female-owned firm in personal services would generate if it were the same personal services firm owned by a man. (It does not estimate the revenues a female-owned personal services firm would earn if it were a high-tech services firm instead.)

The relative closeness of the “Female Counterfactual” line in Figure A2 to the “Male Observed” line suggests that very little of the difference in revenues between female- and male-owned firms can be attributed to observable differences in the types of firms that women and men start.

Figure A1: Logistic regressions of probability of exit, by year

Dependent variable: Exit within the following 12 months
Standard errors in parentheses

	Year 1	Year 2	Year 3
Explanatory variables			
Female	0.004 (0.0291)	-0.017 (0.0323)	-0.014 (0.0374)
Unknown Gender	0.433*** (0.0206)	0.228*** (0.024)	0.180*** (0.0281)
Multi-owner	-0.119*** (0.027)	0.48*** (0.0281)	0.107*** (0.0311)
Owner Age	-0.011*** (0.0008)	-0.009*** (0.0008)	-0.008*** (0.001)
Cash Buffer Days	-0.010*** (0.0004)	0.004*** (0.0003)	0.002*** (0.0002)
Intercept	-0.128 (0.0906)	0.352*** (0.1011)	0.311*** (0.115)

Other control variables

Industry	✓	✓	✓
Cash Flow Pattern	✓	✓	✓
Employer Status	✓	✓	✓
Ln(Revenue)	✓	✓	✓
Observations	129,720	112,294	97,628

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Source: JPMorgan Chase Institute

Figure A2: First-year revenue quantiles for female- and male-owned small businesses



Source: JPMorgan Chase Institute

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Endnotes

- 1 According to data from the US Census Bureau, the Bureau of Labor Statistics, and the US Department of Commerce, as reported by the US Small Business Administration Office of Advocacy, August 2018. <https://www.sba.gov/sites/default/files/advocacy/Frequently-Asked-Questions-Small-Business-2018.pdf>.
- 2 US Census Bureau, 2014.
- 3 Median within-firm small business annual revenue growth rates in our data ranged from 1.8 percent in 2014 to 0.0 percent in 2017. These low median revenue growth rates are consistent with responses to the Federal Reserve's Small Business Credit Survey in 2016, in which a minority of firms report increases in annual revenues. Less than half—42 percent nonemployer firms and 48 percent of small employers with one to four employees—reported an increase in revenues during the previous 12 months. Another 31 percent and 22 percent report no change, respectively (Federal Reserve, 2017a).
- 4 US Census Bureau, as reported in Cantwell, 2014.
- 5 For example, the SBA Women-Owned Small Business Federal Contracting program sets a goal to award at least five percent of federal contracting dollars to women-owned business each year. <https://www.sba.gov/federal-contracting/contracting-assistance-programs/women-owned-small-business-federal-contracting-program>.
- 6 The US Census Bureau's Business Dynamic Statistics measures businesses with paid employees. <https://www.census.gov/ces/dataproducts/bds/methodology.html>.
- 7 The millennial generation is often defined to include those born between 1981 and 1996. A 34-year-old in 2015 would have been born in 1981; consequently the age group under 35 is mostly made up of millennials. The baby boomer generation is typically defined to include those born between 1946 and 1964. This generation would have been between 53- and 71-years-old in 2017, and most of them would be captured in the 55 and over age group.
- 8 Current Population Survey, estimates of civilian noninstitutional population for 2017. <https://www.bls.gov/cps/demographics.htm#age>.
- 9 This decrease in self-employment activity was not simply generational; the rate of self-employment decreased between 1988 and 2014 for both the under-35 and the 35-54 age groups. Although 2.6 percent of 15- to 34-year-olds were self-employed in 2014 compared to 3.9 percent in 1988, the drop for 35- to 54-year-olds was larger, from 10.8 percent to 8.2 percent. In contrast, the share of those age 55 and over that were self-employed rose slightly in the same period, from 6.1 percent to 6.4 percent (Wilmoth, 2016).
- 10 For example, the SBA Small business Investment Company program provides debt and equity finance to small businesses, typically ranging from \$250,000 to \$10 million for financing that includes debt, with an average award of \$3.3M in FY2013 <https://www.sba.gov/funding-programs/investment-capital> https://www.sba.gov/sites/default/files/files/SBIC_Annual_Report_FY2013_508Compliant_1.pdf. In our data, \$400,000 reflected approximately the 95th percentile of annual financing inflows among businesses in our sample for which we observed any financing inflows at all.
- 11 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.
- 12 Statistics from the Business Employment Dynamics show the survival rates of employer establishments in the years subsequent to founding. https://www.bls.gov/bdm/us_age_naics_00_table7.txt.
- 13 Businesses could give more than one reason for ceasing operations. The most common reason was "other." US Census Bureau, Survey of Business Owners, 2012.
- 14 The largest difference is in health care services, which encompasses a particularly large range of firms. Female-owned small businesses comprise nearly half of home health care services, but only about a quarter of physicians and dentists offices. While a more detailed industry-level decomposition could provide additional insight about differences between female- and male-owned firms, such an analysis would be beyond the scope of this current report.
- 15 The analysis was performed on the natural log of revenues. Revenue levels are shown here to aid interpretation.
- 16 Estimates of the effect of owner age on exit from logistic, probit, and ordinary least squares regressions were very similar. The logistic regression estimates reflect the smallest marginal effect of an older owner on firm exit and are therefore conservative.

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