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New Entrants and Small Business Graduation in the Market for Federal Contracts

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A Report of the CSIS Defense-Industrial Initiatives Group

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Abstract:

This paper garners information crucial to understanding business growth for new entrants and small businesses who contract with the federal government by utilizing publicly available contracting data from the Federal Procurement Data System (FPDS) to track new entrants from 2001-2016. This information is then used to evaluate entrances, exits, and status changes among federal vendors with the purpose of comparing challenges faced by small businesses with those of larger ones. Measuring market trends over time and in multiple sectors shows how the challenges facing small businesses, such as market barriers to entry and imperfect competition, keep them from growing. The final results compare the survival rates between small and non-small new entrants contracting with the federal government and analyze the graduation rates for those small new entrants who grew in size during the observation period and survived after ten years. The study finds that around 40 percent of new entrants exit the market for federal contracts after three years, around 50-60 percent after five years, and only about one-fifth of new entrants remain in the federal contracting arena in the final year of observation. Across the six samples studied, the graduation rates of small businesses consistently decrease.

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Executive Summary

Introduction and Context

With an approximately four trillion-dollar budget, the U.S. government has the ability to influence the U.S. economy through its fiscal policies where in 2017, the U.S. economy's GDP was just over 18 trillion dollars.¹ When spending on acquisitions, for instance, federal agencies are obligated by law to set aside prime contract obligations to groups based on a variety of socio-economic classifications such as size, demographics, and geographic location. Moreover, federal agencies such as the Department of Defense (DoD) have realized the importance of attracting new businesses to the federal contracting arena to maintain competitive markets and encourage innovative activity. Due to unique market characteristics such as highly regulatory contracting environments, long and uncertain budgeting processes, and, in some cases, non-competitive markets; the motivation for set aside programs and new business outreach efforts is apparent, but their efficacy is uncertain. Efficacy can be assessed in multiple ways, but one basic and important measure is the extent to which new entrants remain in the market. This paper studies new entrants to the federal contracting arena by calculating survival rates for businesses new to working with all federal agencies and the DoD specifically over time. These survival rates are compared between small and non-small new entrants to investigate how set aside policies work in practice.

The existing body of literature focusing on new-entrant survival rates has identified various firm-level, industry-level, and macroeconomic-level characteristics that impact a new entrant's ability to survive post-entry. One of the most prominent findings from this body of literature is that size impacts a new entrants' ability to survive where non-small firms have higher survival rates than their small competitors. While this body of literature covers a wide-range of industrial sectors, it tends to exclude focusing on

¹ Bureau of Economic Analysis. (n.d.). National Economic Accounts. Retrieved from <https://www.bea.gov/national/index.htm#gdp>

new entrants in the federal procurement arena. The unique dataset used in this study breaks new ground on understanding the dynamics of new entrants contracting with the federal government.

Data and Methodology

The study team utilizes publicly available contracting data from the Federal Procurement Data System (FPDS) to track new entrants from 2001-2016. Six analytical samples of new entrants entering the federal contracting arena as prime contractors each year from 2001-2006 are observed and tracked through 2016. The study team tracks entrants, exits, growth, industry participation, and contract obligations at the firm level throughout this observation period. By tracking this information, the study team can calculate survival rates, graduation rates, and the proportion of contract obligations that go to firms that exit, what proportion goes to those that survive, and what proportion goes to those that graduate from small business status. Furthermore, these results are calculated for new entrants working with all federal agencies and with the DoD uniquely. Finally, the ability to differentiate between small and non-small new entrants allows the study team to draw conclusions related to federal set aside programs.

Results

New Entrant Counts

The data shows that the count of new vendors entering the federal contracting arena as prime contractors from 2001-2016 varies.² 2001-2006 exhibits a buildup of new vendors; however, the counts of new entrants in the federal contracting arena from 2007-2013 dramatically decreases. Since 2013, the number of vendors entering the federal arena has remained relatively low and constant. The buildup of new entrants occurs simultaneously with the beginning years of U.S. military operations in Iraq and Afghanistan, during which the DoD had a higher demand for procurements. Furthermore, DoD expenditures grew at a higher rate than total federal expenditures

² For the purposes of this report, a new entrant is an entity described with a Dunsnumber that has not previously been employed during the study period. This can capture new starting organizations, new work sites for existing organizations, and even long-established organizations making their first foray into federal contracting.

during this time, further signaling that the DoD's growing demand for procurements during this time period could be influencing the rise of new entrants in the federal contracting arena.

Interestingly, the fall of new entrants in the federal contracting arena begins in 2006, two years before the financial crisis and before the peak in overseas contingency operations, and while federal expenditures continued to grow. Starting in 2012, however, the fall in new entrants could likely be linked to the Budget Control Act of 2011 and the resulting decline in federal and DoD contract spending. The Obama Administration made various efforts to promote small businesses and new entrants through policies such as the 2011 QuickPay initiative and the creation of the Defense Innovation Unit Experimental (DIUx) in 2015. While the number of new entrants has not risen since the inception of these initiatives, the DoD continues to emphasize wooing non-traditional vendors today, which will make it interesting to track the counts of new entrants through the upcoming years.

Survival and Graduation Rates

The survival rates show that around 40 percent of new entrants exit the market for federal contracts after three years, around 60 percent after five years, and only about one-fifth of new entrants remain in the federal contracting arena after 10 years. These survival rates are fairly consistent with the results from other studies that calculate the survival rates of new entrants in other sectors of the economy and/or at different time periods.

This paper differs from the existing body of literature in its finding that small new entrants exhibit higher rates of survival in some of the samples and years studied. Small-business new entrants exhibit higher survival rates than their non-small competitors when contracting across all federal agencies for the 2001, 2002, 2003, and 2004 samples. In 2005, small new entrants only have higher survival rates after three years, and non-small new entrants survive at higher rates for the other survival rates examined (e.g. 5-year, 10-year, and 2016 survival rates). These differences between small and non-small new entrants are all statistically different from zero, indicating that

there could be a systematic variation between small and non-small businesses' ability to sustain themselves as vendors in the federal contracting arena.

Conversely, small new entrants in the market for DoD contracts specifically perform better than their non-small competitors in 2004 and 2005. The data from 2002 and 2003 show that non-small new entrants have higher survival rates when working with the DoD than their small competitors and the data from the other years observed are not significantly different from zero. This could indicate that there are unique characteristics associated with the market for DoD contracts that make it harder for small businesses to survive, even with small-business set aside programs. These characteristics could be related to the fact that the DoD contracts with highly concentrated industries that are not as inviting to small new vendors, such as those supplying weapons systems.

Although these results suggest that small businesses tend to have higher survival rates than their non-small competitors across all federal agencies, the low graduation rates of small businesses that survived for 10 years rings alarm bells over the efficacy of small business set aside programs. Across the samples from 2001 to 2006, the graduation rates of small businesses consistently decrease. While in 2001, around 12 percent of small businesses that survive 10 years graduate from small-business status, and in 2006, around six percent of small businesses that survive 10 years graduate from small-business status. This could imply that small businesses face a perverse incentive regarding their business model where since they have safety nets when they remain small, they could be avoiding normal business growth trajectories to maintain the advantages associated with small-business status. Additionally, the decline in graduation rates from the 2001 sample to the 2006 sample aligns with the era of sequestration which could indicate that the downward trend for graduation is connected to the plunging government contract spending during this time.

Discussion and Conclusions

With the large focus on small businesses through set aside programs, the market for federal contracts can look favorable to small new entrants in comparison to their non-small competitors, and this is reflected in the survival rates calculated in this study.

When comparing these results to the graduation rates, however, the efficacy of these set aside programs is less certain. Only between 5-13 percent of small businesses that entered the market for federal contracts and also survived 10 years graduate from small-business status during this study's observation periods. Policy makers should reevaluate their small-business set aside programs as these programs could be creating perverse incentives for small businesses that are contracting with the federal government. Their focus should pivot towards helping small businesses survive simultaneously with growth. Furthermore, policy makers should consider ways to attract new entrants back to the market for federal contracts. The recent counts of low numbers of new vendors entering the federal contracting arena is especially concerning for the DoD given that they have emphasized innovation and non-traditional contracting as crucial aspects of the National Defense Strategy.³

The findings of this report show ample potential for future work on the success of new entrants and small businesses in federal contracting. For instance, as federal acquisition changes in response to shifting strategic guidance, it will be important to maintain market awareness of the demand and supply in the federal contracting market. This awareness is needed to shape acquisition policy to maximize efficiency for both vendors participating in the market and to support federal agencies looking to acquire innovative and affordable solutions. Moreover, it would be interesting to compare survival rates between different set aside programs. While this paper's exclusive focus on small and non-small new entrants sheds light on small-business set aside policies, the analysis does not parse out the effects from those policies specifically focusing on other socio-economic characteristics such as demographics and geographic location.

³ 2018 National Defense Strategy of the United States Summary. (2018). Retrieved from <https://www.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf>

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1. Introduction

Promoting small businesses has been a key issue for economic policymakers since the industrial revolution. This focus is unsurprising given that small businesses have been referred to as the backbone of democracy, because their success unequivocally fosters a more equal distribution of wealth.⁴ Furthermore, an entrepreneur's ability to create new companies and enter new markets is a sign of a healthy economy as the abundance and prosperity of small businesses and new entrants are clear indicators of a sustainable market that allows for both public and private interests to be met. In recent years, policymakers have given greater priority to focusing on obstacles affecting businesses that are newly entering the heavily regulated market for federal contracts. For instance, the Department of Defense's (DoD) desire to access non-traditional vendors galvanized the creation of the DoD's Defense Innovation Unit Experimental (DIUx). Another example is small business promotion under the Obama administration where President Obama strengthened leadership in the Small Business Administration (SBA) to a cabinet-level position and led small-business-friendly initiatives such as QuickPay, which shortened the timeframe federal contracting offices had to pay small vendors.

This paper studies entrances, exits, and status changes of six samples of newly-entered federal vendors and DoD vendors. Each sample observes a set of new entrants in each year from 2001-2006 and examines how they fared over the following ten-year period. For example, the first sample looks at new entrants in 2001 and measures their success through 2011, while the last sample looks at how new firms in 2006 fared through 2016. The study team additionally investigates how these outcomes vary between small and non-small businesses.⁵ The dataset gleaned is novel and the study team's analysis provides insight on the environment confronting new entrants in the

⁴ Bean, J. J. (1996). *Beyond the Broker State: Federal Policies Toward Small Business, 1936-1961*. The University of North Carolina Press.

⁵ The study team uses the Small Business Administration's definitions of small and non-small vendors that considers differences across sectors of the economy. These definitions specify what constitutes as a small business, and then categorizes medium and large businesses together in to one group. For this paper, the study team uses the term 'non-small' to convey medium and large businesses as one group.

federal contracting arena that can inform policy measures designed to expand the contracting marketplace.

There is a wide body of existing literature studying the ability for new entrants, and small businesses specifically, to survive in different industrial sectors. Scholars studying this issue have identified various industry-level, macroeconomic-level, and firm-level characteristics that affect new entrants' and small firms' ability to survive. In the context of public procurement, the literature focusing on the relationship between small businesses and federal contracting tends to focus more on macro measures such as the small business contracting goals, without exploring in depth the implications of policy on cohorts of individual firms. To break new ground in this critical but understudied domain, the study team observed a large longitudinal sample of firms that offers complete information on firm entries, firm exits, and other firm-level characteristics.

The data garnered by the study team tracks firms that entered and stayed in the federal contracting arena from 2001-2016. The following four research questions were posed to study trends in entrants, exits, and graduation among the observed firms:

1. What are the survival rates for new entrants in the market for federal contracts?
2. How do these survival rates compare with the survival rates for new entrants in the defense industrial base specifically?
3. How do these survival rates change between small and non-small businesses?
4. What are the graduation rates for small business new entrants in the federal contracting arena?

This paper seeks to answer these questions in four ways: first, it reviews the existing literature that studies new entrants' ability to survive and specifically how small businesses fare in this context. Second, it outlines the characteristics that have been found to shape a new entrant's ability to survive based on that literature. Third, it describes and analyzes the data that the study team gleaned from the Federal Procurement Data System (FPDS) and the System for Award Management (SAM). Finally, it offers a discussion on the results and draws conclusions from the findings.

Policymakers should be aware of the success rates for small businesses in the market for federal contracts, so they can better adjust or implement policy when needed. In addition, small businesses who might utilize the policy advantages provided to them should be aware of the likelihood of success in certain markets before entering them.

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2. U.S. Government Policies and the Existing Literature

As previously discussed, federal policies take a range of approaches to promote entrepreneurship, competitive markets, equality of opportunity, and employment. Well-rounded participation in the market for federal contracts is key to achieving small business contracting goals so that the federal government can continue to support a healthy and inclusive economy. As the DoD has the largest share of contracting spending of all federal agencies, it is even more important that federal contracting policies aim to alleviate inherent market failure tendencies that occur due to the defense industry's monopsonistic and monopolistic nature. Without clear policy directives to promote competition and outreach to small business, the market for DoD contracts can easily become concentrated for a variety of reasons. First, many products and services bought by the DoD function at a large scope, making it difficult for small businesses to serve as a prime contractor for certain items.⁶ Second, barriers to entry in the market for federal contracts exist. For instance, navigating the highly regulated nature of federal contracting requires any businesses looking to sign a federal contract for the first time to make large structural and personnel investments.⁷ This section serves as a discussion of small business and new entrant policy over time as well as a survey of the existing scholarship studying this issue in support of the topics studied by this paper.

2.1 Small and New Entrant Business Policy History

The U.S. federal government has made supporting business growth an important part of its economic policy for the better part of the last century, with small business promotion being a bipartisan priority throughout this time. In 1932 for instance, the Reconstruction Finance Corporation (RFC) was founded in response to the Great Depression, and it worked with businesses of all sizes as the first federal agency with the express purpose of promoting business growth during peace time. For example, the

⁶ Kovacic, W. E. (1992). Regulatory controls as barriers to entry in government procurement. *Policy Sciences*, 25 (February 1992), 29–42.

⁷ Ibid.

RFC wrote loans to keep businesses of all sizes afloat when the banking system collapsed.⁸ While the federal government has promoted business growth in a variety of ways, this paper is exclusively interested in federal-sponsored initiatives that aid small businesses, disadvantaged businesses, and non-traditional vendors that are looking to participate in the federal contracting arena.

The wartime economy of the 1940s opened the door for small businesses to gain a foothold in federal government contracting. In 1942, the Smaller War Plants Corporation (SWPC) was created as the first government agency to work exclusively with small business. This ensured that small businesses and entrepreneurs had access to contracts and capital when looking for business opportunities that would support the production of resources that contributed to U.S. efforts during World War II. Although the SWPC was disbanded in 1946, a new iteration was created in 1951 to support the U.S. and U.N. war effort in Korea: the Small Defense Plants Administration.⁹

The RFC would later be disbanded with the bulk of its responsibilities absorbed by the Department of the Treasury in 1953. However, to ensure that federal contracting policy continued to focus on small businesses, the Small Business Administration (SBA) was created by the Small Business Act on July 30, 1953. For the last 65 years, the mission of the SBA has been to “aid, counsel, assist, and protect, insofar as is possible, the interests of small business concerns”.¹⁰

As early as the 1960’s, it has been a recurring goal of U.S. small business policy to require federal agencies to grant a set percentage of prime and sub contract dollars to small businesses. This goal was generally viewed as a priority across political parties and administrations, yet no set amount was agreed upon and instituted until 1988, almost 30 years after the original policy was first mandated by President Kennedy.¹¹

⁸ SBA. (n.d.). Our History | The U.S. Small Business Administration |. Retrieved June 5, 2018, from <https://www.sba.gov/about-sba/what-we-do/history>

⁹ Ibid.

¹⁰ Small Business Act PL 112-239, enacted 1/3/13, (Public Law 85-536, as amended). Retrieved from [https://www.sba.gov/sites/default/files/files/Small Business Act.pdf](https://www.sba.gov/sites/default/files/files/Small%20Business%20Act.pdf)

¹¹ Grammich, C., Edison, T., Moore, N., & Keating, E. (2011). *Small Business and Defense Acquisitions: A Review of Policies and Current Practices*. Retrieved from https://www.rand.org/content/dam/rand/pubs/monographs/2011/RAND_MG443.pdf

The 1988 policy directed the federal government to spend 20 percent of their prime contract dollars with small businesses, with this number rising to 23 percent in 1997 when the Small Business Reauthorization Act (Public Law 105-135) was passed. Policy makers have paid special attention to the DoD's capacity for contracting with small or disadvantaged businesses, because of the DoD's overwhelming majority of total federal spending. Consequently, the DoD has their own small-business and disadvantaged-business set aside requirements.¹² The DoD's ability to meet set aside requirements often varies with the industries that the DoD contracts from. For instance, heavily commercial industrial sectors such as construction, maintenance, and housing have a large amount of small business contracts that exceed the government's 23 percent benchmark, while RDT&E and industrial sectors that include weapons procurement tend to fall short.¹³

Goals associated with contracting with businesses owned-by or employing minorities have also been consistently important to policy makers. These protections have gone hand in hand with the early promotion of small businesses dating back to the SWPC in World War II, where the Roosevelt administration barred defense contractors from discriminating against African American workers. These protections were reinforced during the Kennedy and Johnson administrations with the introduction of affirmative action policies, first by executive order 10925 (26 C.F.R. 1977, 1961) and later congressionally mandated as part of the Civil Rights Act in 1964.

Section 8(a) of the Small Business Act of 1953, which states in subsection C that "It shall be the duty of the Administration ... to make an award to a small business concern owned and controlled by socially and economically disadvantaged individuals..." (*Small Business Act*, 2013) was revisited in 1967 and used in tandem with affirmative action legislation to boost minority owned business participation in DoD

¹² DoD. (n.d.). Small Business Program Goals and Performance. Retrieved from <https://business.defense.gov/About/Goals-and-Performance/>

¹³ When calculating these required percentages, there are a number of contract dollars exempt from the equation such as contract dollars associated with non-appropriated funds, internal transactions, mandatory sources, transactions with foreign governments and international organizations, work performed outside the United States, and procurements not subject to federal acquisition regulations - Ibid.

procurement.¹⁴ This became a central piece of Nixon-era affirmative action and civil rights policy and was continued through the Ford administration. In 1979, language of “socially disadvantaged individuals” in Section 8(a)(C) was further expanded to promote women-owned small businesses.¹⁵ In addition to competing for set aside contracts, businesses that qualify for certification under Section 8(a) receive assistance from the SBA as well as mentorships from cooperating established industry leaders to help them navigate the federal contracting arena.

Certifications through Section 8(a) are limited to a maximum of nine years, with reviews conducted annually (“8(a) Business Development Program”). Women Owned Small Businesses (WOSB) and Service Disabled Veteran Small Businesses (SDVOSB) can qualify for Section 8(a) benefits but also have specific set asides in place for five and three percent of total prime contract obligations, respectively. WOSBs and SDVOSBs do not have a time limit for the certification of their access to these set asides, but WOSBs must update their certification status annually to retain their benefits.¹⁶

Shifting from demographic considerations to issues such as promoting innovation, Congress created the Small Business Innovation Research (SBIR) program in 1982 and the Small Business Technology Transfer (STTR) Program in 1992. These two programs encouraged federal agencies to award R&D contracts to small businesses when the federal agencies had the economic means to do so. These programs are set up so that firms are supported through a three-phase process that works to solicit competition from small businesses that don't traditionally work with government.

The first two phases aim to meet current federal agency acquisition demands (for instance, the DoD offers approximately 600 topics of research annually), where businesses are awarded funding to propose ideas (Phase I) and detailed proof of

¹⁴ Bean, *Beyond the Broker State*, 66.

¹⁵ Grammich, C. Edison, T., Moore, N., & Keating, E. *Small Business and Defense Acquisitions*, 16-17.

¹⁶ Women-Owned Small Business Federal Contracting program. (n.d.). Retrieved July 18, 2018, from <https://www.sba.gov/federal-contracting/contracting-assistance-programs/women-owned-small-business-federal-contracting-program>

concepts (Phase II).¹⁷ Nearly 2,500 Phase I (1,539) and II (943) awards were granted to small businesses in 2017 for DoD programs.¹⁸ Phase III of the contract awards concern development and commercialization. Government contracts that carry a Phase II project into Phase III are not funded through SBIR/SBTT, instead utilizing funds from other DoD programs or from a major DoD prime contractor. The DoD has steadily increased the percentage of their budget set aside for small business R&D programs each year, with 3.2 and 0.45 percent set for SBIR and STTR, respectively, in 2017 (up from 2.6 and 0.35 percent in 2012).¹⁹ Volume one of the Section 809 panel report released in January 2018 states that these programs “provide a 10-fold return on investment” and recommends their continued expansion in future budget proposals.²⁰

The next expansion returned to disadvantaged firms but focused on geography rather than the vendor characteristics. The Small Business Reauthorization Act also established the Historically Underutilized Business Zone (HUBZone) program (Title 15 USC § 657a) to “promote economic development opportunities in metropolitan or rural areas with low income, high poverty rates, and/or high unemployment rates”.²¹ HUBZones are categorized as areas falling into one of five classifications: qualified census tracts, qualified counties, Indian reservations, difficult development areas, and military bases closed under the Base Realignment and Closure (BRAC) Act. The SBA uses set-asides, sole source awards, and price preferences to facilitate contracts in HUBZone areas.²² There is no limit to the amount of time a qualifying business can receive HUBZone program benefits, but all certifications must go through a

¹⁷ SBIR/STTR. (n.d.). Retrieved July 12, 2018, from <https://business.defense.gov/Programs/SBIR-STTR/>

¹⁸ List | SBIR.gov. (n.d.). Retrieved July 5, 2018, from [https://www.sbir.gov/sbirsearch/award/all?f\[0\]=im_field_agencies:105729&f\[1\]=itm_field_award_yr:2017&f\[2\]=im_field_program:105792&f\[3\]=im_field_program:105791](https://www.sbir.gov/sbirsearch/award/all?f[0]=im_field_agencies:105729&f[1]=itm_field_award_yr:2017&f[2]=im_field_program:105792&f[3]=im_field_program:105791)

¹⁹ DoD SBIR/STTR Program. (n.d.). Retrieved July 12, 2018, from <https://www.acq.osd.mil/osbp/sbir/about/index.shtml>

²⁰ Section 809 Panel. (2018). *Report of the Advisory Panel on Streamlining and Codifying Acquisition Regulations, Volume 1 of 3, January 2018*. Retrieved from https://section809panel.org/wp-content/uploads/2018/04/Sec809Panel_Vol1-Report_Jan18_REVISED_2018-03-14.pdf, 2.

²¹ Beale, H., & Deas, N. (2008). *The HUBZone Program Report*. Retrieved from <https://www.sba.gov/sites/default/files/rs325tot.pdf>, 1.

²² Ibid., 7.

reassessment and approval every three years.²³ The 1997 Small Business Reauthorization Act set the goal of three percent of prime contracts to be awarded to HUBZone area businesses (P.L. 105-135). However, the DoD has sometimes fallen short in meeting HUBZone contracting goals where in 2016, for instance, the DoD's HUBZone contracting achievement was 1.57 percent and in 2017, 1.56 percent of qualifying DoD prime contracts went to HUBZone area businesses, totaling 4.1 billion dollars while the goal was still 3 percent.²⁴

The Obama Administration contributed to small-business promotion in the federal contracting arena through a variety of initiatives. For instance, the leverage of the SBA was bolstered after President Obama promoted the SBA's administrator to a cabinet-level position in 2014.²⁵ Additionally, the Obama administration founded the QuickPay initiative, which aimed to expedite payments to small businesses working on federal contracts. In doing so, the initiative hoped to provide higher liquidity for small-business new entrants whose quick access to capital was a key factor to their success.²⁶ Furthermore, the QuickPay initiative evolved to encourage large prime contractors subcontracting federal contracts to small businesses to shorten the time before the small subcontractors were paid. To incentivize this, the federal government pledged to pay their large prime contractors more quickly on the condition that they had to expedite paying their small sub-contractors.²⁷

²³ HUBZone Program. (n.d.). Retrieved July 18, 2018, from <https://www.sba.gov/federal-contracting/contracting-assistance-programs/hubzone-program>

²⁴ Small Business Administration. (2017). *FY 2017 Small Business Procurement Scorecard*. Washington DC. Retrieved from https://www.sba.gov/sites/default/files/2018-05/DOD_Scorecard_FY2017_0.pdf; Small Business Administration. (2017). Department of Defense FY2016 Small Business Procurement Scorecard. Retrieved from <https://www.sba.gov/sites/default/files/aboutsbaarticle/FY16.DepartmentofDefense.pdf>

²⁵ Marks, G. (2015). President Obama's small business scorecard. Retrieved from https://www.washingtonpost.com/news/on-small-business/wp/2015/11/16/gene-marks-president-obamas-small-business-scorecard/?utm_term=.1e0c3839972c

²⁶ Sink, J. (2014). Obama moves to speed up payments to small-business contractors. Retrieved from <http://thehill.com/blogs/blog-briefing-room/news/211909-obama-moves-to-speed-up-payments-to-small-business-contractors>

²⁷ The White House Office of the Press Secretary. (2014). President Obama Announces New Partnership with the Private Sector to Strengthen America's Small Businesses; Renews the Federal Government's QuickPay Initiative. Retrieved from <https://obamawhitehouse.archives.gov/the-press-office/2014/07/11/president-obama-announces-new-partnership-private-sector-strengthen-amer>

In 2015, the DoD created the DIUx to aid in incentivizing commercial industry to work with the government by promoting and streamlining interactions between DoD and nontraditional contractors. Along with more traditional entities such as the Army and DARPA, DIUx has facilitated the award of other transaction authority agreements and streamlined contracts to nontraditional businesses that tend to be more flexible than traditional contracts with the goal of hearing proposals, awarding contracts, and seeing a prototype within a 60-day period.²⁸ While DIUx is open to both large and small businesses, the program is particularly beneficial to small businesses and startups that specialize in innovative technology, because it offers both a platform and the funding necessary to give those businesses the opportunities to exercise their innovative prowess. The DoD had secured 60 contracts with startups through DIUx as of the beginning of 2018 and has been increasingly emphasizing the importance and potential of the program.²⁹

2.2 Small Business Definitions

Although small business is a commonly used term throughout both academic research and policy enactment, it has no universally accepted definition. In 1959, for instance, it was observed that “the differences in the administrative structure of the very small and the very large firms are so great that in many ways it is hard to see that the two species are of the same genus ... We cannot define a caterpillar and then use the same definition for a butterfly”.³⁰ Accordingly, describing a firm as a small business, relative to a medium or a large business, suggests that there exist characteristics that distinguish businesses and depend on their size.

Over the years, there have been many other efforts to either determine a standard classification for small business or to adopt a practical, if specialized, definition that can be used in a study based on the author’s focus and purpose. Each definition

²⁸ Williams, L. C. (2017, December 7). DOD looks to DIUX for the future of acquisition. *FCW*. Retrieved from <https://fcw.com/articles/2017/12/07/diux-sasc-acquisition-future.aspx>

²⁹ Ibid.

³⁰ Bridge, S, O’Neill, K, & Cromie, S. (2003). *Understanding enterprise, entrepreneurship and small business*. London: Palgrave Macmillan. <https://doi.org/10.1177/1350508408088530>

had its own advantages and drawbacks, and can largely be divided into quantitative descriptions,³¹ and qualitative descriptions.³²

The quantitative classifications face several criticisms, most generally that the reality of small business is far more nuanced than these bounded determinations can express.³³ For example, the measure of employee counts runs into problems with the growth of a part-time, temporary, or contingent workforce.³⁴ Moreover, monetary measures can be inconsistent due to variable reporting practices and varying business success metrics such as cash flow, annual revenue, or turnover.³⁵ Additionally, qualitative descriptions suffer due to standardization challenges.

In the United States, the SBA's small business size standards are the common reference point for size determination in U.S. set aside programs, however, these definitions also have faced numerous criticisms.³⁶ First, the SBA definitions tend to be rather wide, covering over 99 percent of all companies in the United States that have employees.³⁷ By the SBA's standards, the threshold for whether a business is small depends on what industrial sector that business works in. The thresholds vary and can range from 250 to 1,500 in average employment or from \$750,000 to \$38,500,000 in average annual receipts.³⁸ Thus, these metrics can be subjective in some cases. For

³¹ Nappi, A. T., & Vora, J. (1980). Small business eligibility : A definitional issue. *Journal of Small Business Management*, (November), 60–63.; Audretsch, D. B., & Mahmood, T. (1995). New Firm Survival : New Results Using a Hazard Function. *The Review of Economics and Statistics*, 77(1), 97–103.; Cader, H. A., & Leatherman, J. C. (2011). Small business survival and sample selection bias. *Small Business Economics*. <https://doi.org/10.1007/s11187-009-9240-4>; Grammich, C., Edison, T., Moore, N., & Keating, E. *Small Business and Defense Acquisitions*; Chowdhury, M. S., Islam, R., & Alam, Z. (2013). Constraints to the Development of Small and Medium Sized Enterprises in Bangladesh : An Empirical Investigation, 7(8), 690–696.; Flynn, A., McKevitt, D., & Davis, P. (2015). The impact of size on small and medium-sized enterprise public sector tendering. *International Small Business Journal*, 33(4), 443–461. <https://doi.org/10.1177/0266242613503178>

³² Ang, J. S. (1991). Small Business Uniqueness and the Theory of Financial Management, 1(1), 11–13.

³³ Torrès, O., & Julien, P. A. (2005). Specificity and denaturing of small business. *International Small Business Journal*, 23(4), 355–377. <https://doi.org/10.1177/0266242605054049>

³⁴ Berisha, G., & Pula, J. S. (2015). Defining Small and Medium Enterprises: a critical review, 1(1), 17–28.

³⁵ Berisha & Pula, *Defining Small and Medium Enterprises*.

³⁶ SBA. (2016). Table of USA Small Business Size Standards Matched to North American Industry Classification System Codes. Retrieved from https://www.sba.gov/sites/default/files/files/Size_Standards_Table.pdf

³⁷ Harrison, J. D. (2013). Who actually creates jobs: Star-ups, small businesses or big corporations? *The Washington Post*. Retrieved from https://www.washingtonpost.com/business/on-small-business/who-actually-creates-jobs-start-ups-small-businesses-or-big-corporations/2013/04/24/d373ef08-ac2b-11e2-a8b9-2a63d75b5459_story.html?utm_term=.5708f9117c56

³⁸ SBA, *Table of USA Small Business Size Standards*.

instance, during the analysis for this paper, the study team found a case where a vendor that made over six million dollars in annual 2011 revenue was classified as small because it had less than 100 employees.³⁹ Second, some firms span more than one sector and may qualify as small within one sector and not within another, creating policy implementation challenges. By comparison, the European Union's (EU) definition of Small and Medium Enterprises applies limits to both staff headcount and revenue (as measured by turnover or balance sheet total). The EU definition sets a cap of 250 employees for medium businesses, and only 50 employees for small.⁴⁰

2.3 New Entrants and the Limitations of Small Business Promotion

Both academics and policy analysts have questioned the efficacy of these small-business and new-entrant promotion mechanisms, arguing that there is a disconnect between policy goals and the incentives created in practice. Moreover, a series of critiques against using employment growth as the justification for small business programs has shed light on areas where policy makers can potentially clarify such policies and establish evaluation processes to better understand and track policy outcomes. These two facets of small business policy criticism should be considered when studying new-entrant and small-business success, and this section will serve as an overview of these criticisms.

The recognized disconnect between small-business and new-entrant policy goals and the incentives that these policies create in practice is often referred to as the contracting cliff. When small businesses contracting in the federal arena outgrow their small business classifications, they are forced to compete with larger incumbent firms. As newly-minted medium-sized vendors, these firms are thrown into the less supported non-small market for federal dollars as larger firms on paper but, in practice, remain relatively small compared to some of their incumbent competitors. Although they grew beyond their small-business classification, these graduated firms still face barriers such

³⁹ See Chapter 5: Trends for New Entrants, Survivors, Graduates, and Incumbent Firms for a more detailed description of this case.

⁴⁰ European Commission. (n.d.). Internal Market, Industry, Entrepreneurship and SMEs. Retrieved from http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_en

as reaching economies of scale and navigating highly concentrated industries, especially for those firms working with the DoD. Thus, new entrants participating in small-business set-aside programs could be perversely incentivized to reject business growth, which, in an efficient market environment, should be the natural and desirable trajectory for a new entrant small business.

One traditional motivation for policymakers in setting small business policy and in encouraging new-entrants is the idea that startups are one of the largest sources of job creation. The literature supporting this idea argues that since startups are new, they add jobs to the economy during their year of inception.⁴¹ Further work studying this issue, however, has determined that due to low survival rates of small businesses, the net effect of their contribution to employment growth in the economy diminishes over time and, in the long-run, startups are not one of the largest sources of job creation.⁴² Furthermore, scholars have found that different sized firms within the small business category contribute to net job creation differently. Firms with fewer than 20 employees did not contribute to net employment rates while firms that employ between 20 and 499 people do impact job creation after they have survived for six years.⁴³ Recently, academic scholarship has found that job creation from new vendors experiences the barbell effect. In other words, startups less than six years old and incumbent firms greater than 28 years old contribute the most to employment growth.⁴⁴

Another development in the literature with regards to using employment growth as a motivation for policy focusing on small businesses and new entrants is the finding that high-impact businesses contribute the most to job creation. High-impact businesses is a term referring to businesses that specialize in technology and innovation such as firms in the science, technology, engineering, and mathematics sectors. High-impact businesses are also characterized by firms that have doubled either sales or employment during a four-year timeframe.⁴⁵ Scholars have found that high-impact

⁴¹ Headd, B. (2010). *An Analysis of Small Business and Jobs*. Retrieved from [https://www.sba.gov/sites/default/files/files/an analysis of small business and jobs\(1\).pdf](https://www.sba.gov/sites/default/files/files/an%20analysis%20of%20small%20business%20and%20jobs(1).pdf)

⁴² Ibid.

⁴³ Dilger, R. J. (2018). *Small business administration and job creation*.

⁴⁴ Ibid.

⁴⁵ Ibid.

businesses foster job creation and that this result traverses different size, industry, and geographic characteristics.⁴⁶ These critiques of small-business and new-entrant policy mechanisms highlight the need for policymakers to understand the importance of characteristics such as age and survival rates. The analysis used in this paper examining the survival rates and graduation rates of new entrants across different size classifications will help inform whether it is likely that contracting cliffs or the barbell effect exist in the federal contracting arena.

⁴⁶ Ibid.

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3. Variables associated with New Entrants' Success

The current body of literature that studies new entrants' survivability has identified three buckets in which the characteristics affecting the survival rates of new entrants exist: firm-level characteristics, industry-level characteristics, and macroeconomic-level characteristics. This section discusses the existing literature's findings on these characteristics in support of the areas focused on in this paper when studying new entrants in general and, in particular, those new entrants that are classified as small and are pursuing federal contracts. One of the most prominent findings from this body of literature is that size impacts a new entrants' ability to survive where non-small firms have higher survival rates than their small competitors. While this paper's analysis uniquely focuses on size, this section will cover all associated variables to build a comprehensive understanding of this issue.

3.1 Firm-level Characteristics

Size

The theories on how size affects new entrants' survival have evolved over time. Scholarship studying new firm survival initially accepted Gibrat's law, which states that firm survival and subsequent growth is independent from firm size.⁴⁷ This law was challenged, however, by subsequent scholars studying small businesses and firm survival. For instance, multiple scholars have found that small firms have a higher likelihood of exiting the market compared to larger firms.⁴⁸ Moreover, one scholar argues that the preponderance of support for the evidence that small firms are more

⁴⁷ Agarwal, R., & Audretsch, D. B. (2001). Does Entry Size Matter? The Impact of the Life Cycle and Technology on Firm Survival. *The Journal of Industrial Economics*, 49(1), 21–43.

⁴⁸ Evans, D. S. (1987). The Relationship Between Firm Growth, Size, and Age: Estimates for 100 Manufacturing Industries. *The Journal of Industrial Economics*, 35(4), 567–581.; Hall, B. H. (1987). The Relationship Between Firm Size and Firm Growth in the US Manufacturing Sector. *The Journal of Industrial Economics*, 35(4), 583–606.; Dunne, T., Roberts, M. J., & Samuelson, L. (1988). *Patterns of Firm Entry and Exit in U. S. Manufacturing Industries*. Wiley on behalf of RAND Corporation (Vol. 19).; Audretsch & Mahmood, *New Firm Survival*.; Grammich, Edison & Moore, *Small Business and Defense Acquisitions*.

likely to exit the market has become a stylized fact.⁴⁹ The literature thereafter follows this view and, as a result, includes variables that measure firm size when analyzing survival rates and growth for new entrants.

Size critically affects a business's ability to survive, because small businesses are disadvantaged by their inability to operate at the minimum efficient scale level of output from the beginning.⁵⁰ Small firms experience a cost disadvantage compared to their larger, incumbent competitors and are therefore more likely to fail. In the context of public procurement, one study finds that within the definition of small businesses, there are further subsets of size that differentiate micro-businesses from small businesses in general, and these two groups tend to experience different survival and growth rates when participating in public tendering.⁵¹

In addition to alleviating anti-trust threats and providing technical assistance, small-business policy aims to utilize public acquisition dollars as a tool for enhancing demand for small businesses that are in the market for federal contracts. Given these theoretically favorable opportunities for small businesses, small firms in the federal market might have a greater chance of survival than their commercial market counterparts, or possibly even their non-small counterparts. A 2008 survey found that when small businesses were asked to rank the 75 problems that most concern them, small business participants listed, on average, being awarded a federal contract as 71st out of 75.⁵² This could reflect the comparative accessibility of the federal market, or that federal contracting is not relevant to most small businesses. Either way, the literature reviewed by the study team has not examined the comparative strength of challenges facing small businesses versus the advantages granted them by the federal system.

The literature review findings on the effect that size has on new entrants' survival rates provides the foundation for the study team's comparison of survival rates for small

⁴⁹ Geroski, P. A. (1995). What do we know about entry? *International Journal of Industrial Organization*, 13, 421–440. Retrieved from https://ac-els-cdn-com./016771879500498X/1-s2.0-016771879500498X-main.pdf?_tid=d18e6fec-bb2b-11e7-b27d-00000aacb362&acdnat=1509118433_6e9358e50c2341b4a5ffd9889f58f149

⁵⁰ See discussion from Agarwal & Audretsch, *Does Entry Size Matter?*

⁵¹ Flynn, McKevitt, & Davis, *The impact of size on small and medium-sized enterprise public sector tendering*.

⁵² Grammich, Edison, Moore, & Keating, *Small Business and Defense Acquisitions*.

and non-small firms. Analyzing this comparison in the context of federal contracting—with the dataset gleaned by the study team—is novel. Other firm-level characteristics have been found to influence the survivability of new entrants but are beyond the scope of this study. These include firm age, firm ownership and demographics, firm nationality, and firm location.

3.2 Industry-level Characteristics

The characteristics which shape each industry create environments that have differing effects on the ability for new entrants to enter and survive. For this reason, policymakers and scholars who study new entrants account for the differing environments across industries. For instance, the SBA's definition of a small business varies depending on industry sector. Furthermore, scholars who have studied survival rates for new entrants tend to acknowledge these differences by implementing variables that measure industry-level characteristics that have been shown to influence a new entrant small business's likelihood of survival.⁵³ The literature has focused on the following industry-level characteristics: degree of competition, innovation rate, industry growth rate, and capital intensity in an industry.

Degree of Competition

As one of the pillars supporting a healthy market, the degree of competition impacts the conditions facing new entrants and their ability to survive in a market. Competitive markets provide more opportunity for growth, which enables firms to more easily reach the minimum efficient scale. One pair of scholars posit that risk is higher for new entrants in markets that are more concentrated, because incumbent firms have the ability to instate harsh conditions for new competitors.⁵⁴ Moreover, these scholars explore the relationship between firm survival and price-cost margins because price-cost margins can be an indication of how concentrated a market is, as firms operating in

⁵³ Audretsch, D. B. (1991). New-Firm Survival and the Technological Regime. *The Review of Economics and Statistics*, 73(3), 441–450.; Audretsch & Mahmood, *New Firm Survival*.; Reijonen, H., Tammi, T., & Saastamoinen, J. (2016). SMEs and public sector procurement: Does entrepreneurial orientation make a difference? *International Small Business Journal*, 34(4), 468–486. <https://doi.org/10.1177/0266242614556661>

⁵⁴ Audretsch, & Mahmood, *New Firm Survival*.

highly concentrated industries tend to experience high price-cost margins.⁵⁵ On the one hand, high price-cost margins can be a positive market characteristic for new entrants because it can act as a buffer when size-related cost disadvantages associated with being a new entrant are a reality. On the other hand, elevated price-cost margins tend to exist in highly concentrated markets where, as previously discussed, new entrants face obstacles intentionally created by their incumbent and powerful competitors.

Industry Growth Rate

Industry growth rates have been shown to affect survival rates because growth rates have been found to increase price-cost margins and, as discussed above, price-cost margins can be either a positive or negative market characteristic for new entrants, depending on the situation.⁵⁶ Like degree of competition, industry growth rates influence the price-cost margins, which in turn, impact the operations of companies in that industry. Heightened price-cost margins create environments where participating firms can survive while operating at a suboptimal level of scale, thus influencing the ability for new firms to survive.⁵⁷

Innovation

The innovation rate of an industry that a firm enters is an important variable that the current literature cites as having an impact on small business new entrants' survival rates. The essence of accounting for an innovation rate is to capture how crucial it is for companies to be introducing new products in the industry they are working in.⁵⁸ While there are various ways to define an industry's innovation rate, a methodology common to the literature studying new entrants and small businesses takes the number of innovations made by firms in a certain industry and divides that by the number of employees in the same industry.⁵⁹

⁵⁵ Ibid.

⁵⁶ Bradburd, R. M., & Caves, R. E. (1982). A Closer Look at the Effect of Market Growth on Industries' Profits. *The Review of Economics and Statistics*, 64(4), 635–645.

⁵⁷ Audretsch & Mahmood, *New Firm Survival*.

⁵⁸ Audretsch, D. B. (1995). Innovation, growth and survival. *International Journal of Industrial Organization*, 13(4), 441–457. [https://doi.org/10.1016/0167-7187\(95\)00499-8](https://doi.org/10.1016/0167-7187(95)00499-8)

⁵⁹ Audretsch, *Innovation, growth and survival.*; Audretsch & Mahmood, *New Firm Survival*.

Technological or informational conditions that dictate the amount of innovation necessary to succeed in an industry also influence the ability for new entrants to survive in a market, and this idea has been explored by multiple scholars.⁶⁰ One scholar finds that industries differ, with some operating as a ‘routinized regime’ and others as an ‘entrepreneurial regime.’⁶¹ Industries characterized as a ‘routinized regime’ are more favorable to innovative activity performed by established incumbent firms who already have the capital and knowledge base to effectively innovate and survive. Conversely, ‘entrepreneurial regimes’ foster innovative success for new entrants and small businesses by giving new entrants an innovative advantage over their incumbent competitors. As a result, the type of innovation environment is important to consider along with the innovation rate of an industry itself. One group of scholars empirically test how hazard rates for new entrants depend on innovation rates and estimate that new entrants face a higher risk of failure in highly innovative environments. However, their results are not statistically significant.⁶²

Capital Intensity

Theoretically, high capital intensity makes it harder for new entrants—and especially small businesses—to survive and grow in an industry. This is because it is more difficult to acquire the necessary resources needed to operate in a capital-intense environment before operating at the minimum efficient scale. Moreover, incumbent firms in capital-intensive industries likely operate with economies of scale, giving them an advantage over newly-established competitors. On the one hand, one scholar found that the likelihood of survival for small, newly-established firms is lower in capital-intensive industries that are dominated by scale economies.⁶³ On the other hand, industries that exhibit high levels of investment in human capital and pay higher wages reflect the tendency to invest heavily in labor-related costs. These labor-related investments could involve training or firm-specific skills, and industries that house firms

⁶⁰ Winter, S. G. (1984). Schumpeterian Competition in Alternative Technological Regimes. *Journal of Economic Behavior and Organization*, 5, 287–320.; Audretsch & Mahmood, *New Firm Survival*.

⁶¹ Ibid.

⁶² Audretsch & Mahmood, *New Firm Survival*.

⁶³ Audretsch, *New Firm Survival and the Technological Regime*.

who make such investments tend to have a higher likelihood of survival for new entrants.⁶⁴

3.3 Macroeconomic-level Characteristics

The third and final set of characteristics that may influence a firm's likelihood of survival pertains to macroeconomic variables. The state of the economy influences business success across all levels of business size and thus should be considered when estimating the survival rates of new entrants. The point in time of the business cycle, the unemployment rate, and inflation rates all influence factors such as investment, GDP, employment, and demand. Previous work on this topic has acknowledged these relationships by including variables that describe various macroeconomic characteristics, such as unemployment and real interest rates, in order to control macroeconomic variables and estimate the impact of new entrant size on the likelihood of survival more accurately.

⁶⁴ Audretsch & Mahmood, *New Firm Survival*.

4. Data and Specification

The study team collected the data for this report from the Federal Procurement Data System (FPDS) and the System for Award Management (SAM). The study team gleaned data on a yearly basis, measuring a wide variety of variables on new entrants in the market for federal contracts from these two sources and merged them together by firm. The result is a longitudinal data set that provides information on firms entering and exiting the market on an annual basis over the period from 2001-2016.

As part of the analysis, the study team subsets the collected data to six analytical samples of new entrants in the market for both government-wide and DoD-specific contracts. Each sample includes all new entrants starting in year t where $t = 2001-2006$. Each sample is tracked over the decade following t and then re-examined in the last year of the observation period, 2016. To define new entrants, the study team intended to use the registration date in SAM to indicate when a firm entered the market for federal contracts. As this project developed, however, the study team discovered faults in reporting practices from SAM and had to define entries by using the first signed date variable provided in FPDS. To define exits, the study team uses the last signed date within the 10-year study period from FPDS. As a follow-up analysis, the study team extended the 10-year study periods by checking whether the firms had exited in the last year of observation: 2016.

Given the information on entries and exits, the study team calculates the i -year survival rates for each of the six samples of new entrants where i can equal three, five, or ten. The survival rate is equal to the number of firms that survived in the i^{th} year divided by the total number of firms that entered in the baseline year (2001, 2003, 2004, 2005, or 2006). These calculations are made for all new entrants, small-business new entrants, and non-small new entrants. The same calculations are made for those new entrants contracting specifically with the DoD. Furthermore, the study team calculates the graduation rates of small businesses for each of the six samples. The study team considers small business graduation to occur through either organic firm growth or

acquisition by a larger company.⁶⁵ In this analysis, a small business is considered to graduate if it changes during the 10-year observation period from small-business status to medium-or large-business status for the majority of the contract obligations that it has with the federal government. The graduation rates are then calculated by dividing the number of graduated firms that also survived in year 10 over the 10-year observation period by the total number of small firms that entered the market in the baseline year.

The study team initially used SAM data to supplement the FPDS data. All vendors intending to contract with the federal government must register with SAM prior to receiving an award. When a contract is awarded to a registrant in SAM, all of the vendor information is pulled from SAM into FPDS, which stores government-wide contract award data. Thus, there should be more vendors registered with SAM than those listed in FPDS, since some vendors that register with SAM never receive a government contract, as the relationship demonstrated by Figure 1.

Yet, when the study team attempted to pull vendor data from SAM for all the vendors that registered in or after 2001, the resulting entries proved incomplete. Instead of following the relationship demonstrated by Figure 1, the two data sources exhibited a relationship demonstrated by Figure 2. Thus, it was clear to the study team that the data provided by SAM was incomplete. The SAM database has two methods for data retrieval, either querying the database to return all entries that match a single or set of specific search criteria or submitting individual 13-digit DUNS numbers, one at a time, to retrieve the corresponding vendor information. The study team explored both of these methods but was not able to achieve success in extracting a complete set of data.⁶⁶ Thus, due to better data availability and quality, the study team elected to use only FPDS data.

⁶⁵ As discussed in the Appendix, the unit of analysis for this study is the Vendor Dunsnumber as reported by FPDS. Dunsnumbers capture both a location and a line of operations, so while small firms may only have a single dunsnumber, large firms may have many. If after a merger and acquisition a dunsnumber continued to be used, the vendor would count as having survived. If the acquisition resulted in a worksite being shut down, its dunsnumber may be no longer be used in which case the study team would not consider the firm to have survived.

⁶⁶ See appendix 1 for a detailed explanation on the methods used by the study team to extract SAM data.

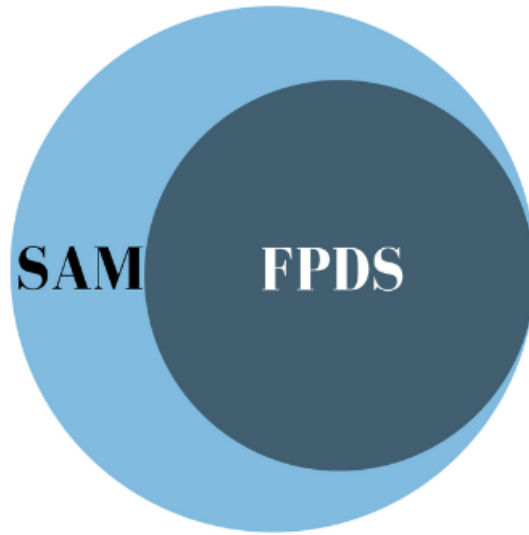


Figure 1: Expected SAM and FPDS Data

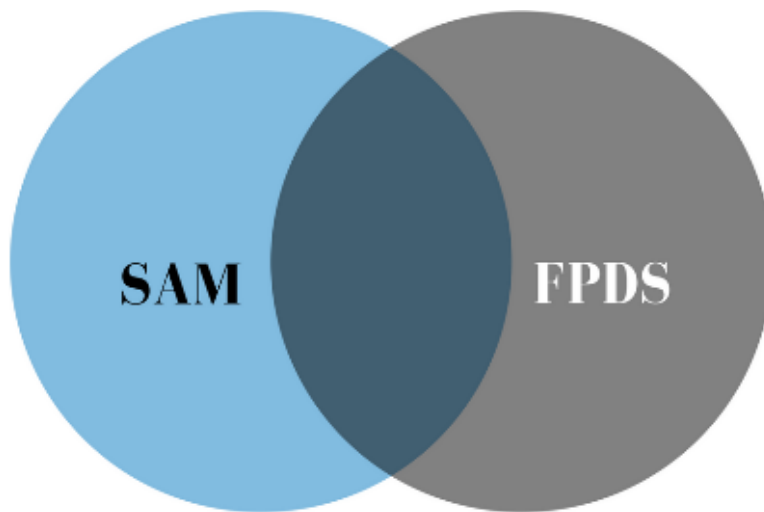


Figure 2: SAM and FPDS in Available Data

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5. Trends for New Entrants, Survivors, Graduates, and Incumbent Firms

The number of new entrants that entered the market for federal contracts, and the market for DoD contracts specifically, each year from 2001 to 2016 is reported in Figure 3. The overall trend for the entire time period is similar for both new entrants in the market for all federal contracts and for those contracting with the DoD specifically. The trends show a consistent increase in each year from 2001 to 2005 where the net increase of new entrants overall is about 30 thousand. After 2005, the number of businesses entering the federal arena decreases consistently until 2013, where the last four years of the study period maintain a more consistent number of new businesses. The DoD has experienced similar trends regarding the change in the number of new businesses contracting with them each year over the observation period. Additionally, the DoD follows the trends for all federal agencies where the majority of new entrants entering the federal arena are small businesses.

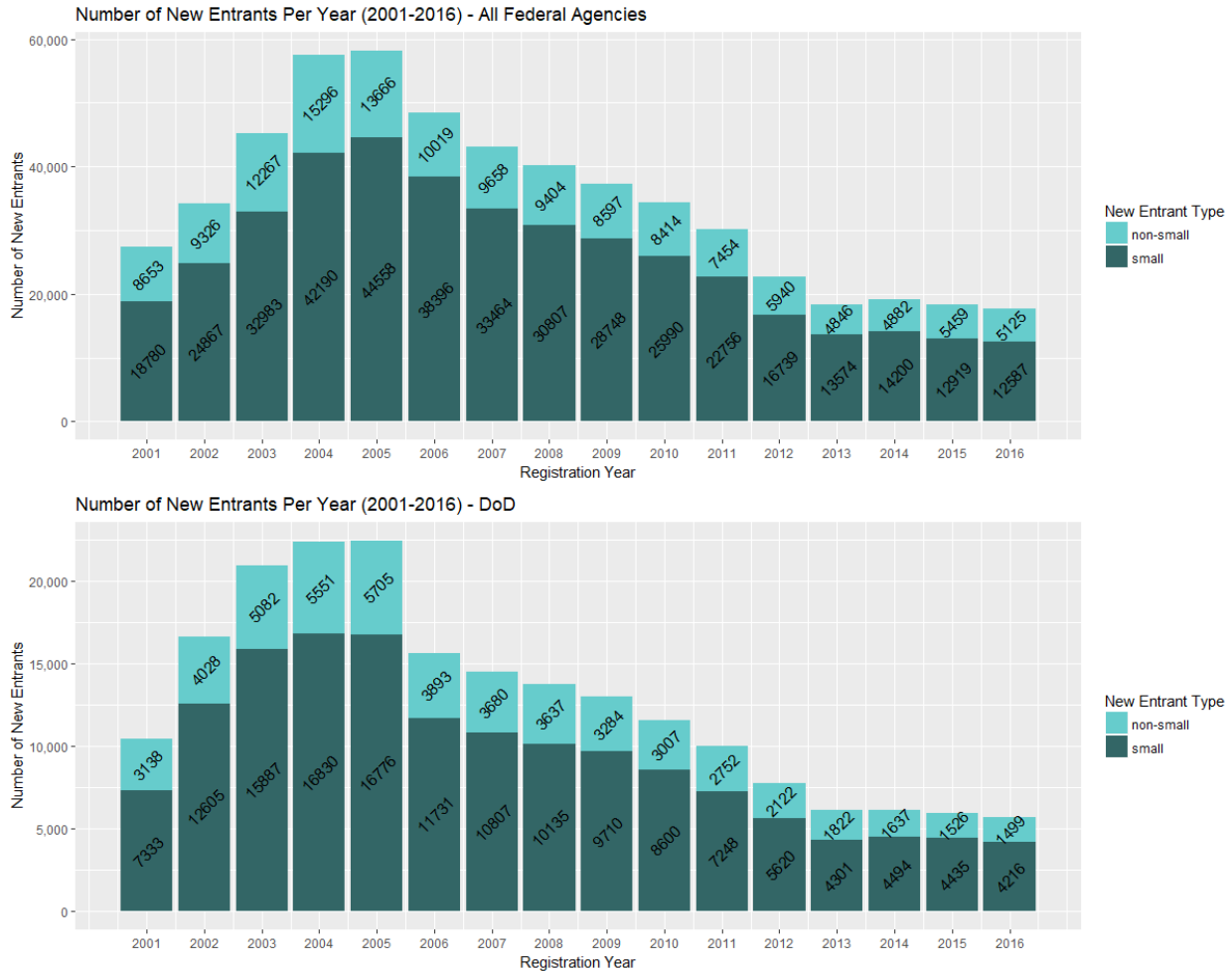


Figure 3: Number of New Entrants Per Year

Figure 4 visualizes the number of new entrants in each of the six samples over time for vendors working with all federal agencies and DoD uniquely. All six samples exhibit similar trends where the number of new entrants since the baseline year of entry declines over the observation period. For all six samples, the biggest decrease in the number of firms surviving is one year after the baseline year of entry. After one year post-entry, the samples tend to decrease at a decreasing rate, where towards the end of the observation period the number of new entrants that survived remains relatively constant from year to year.

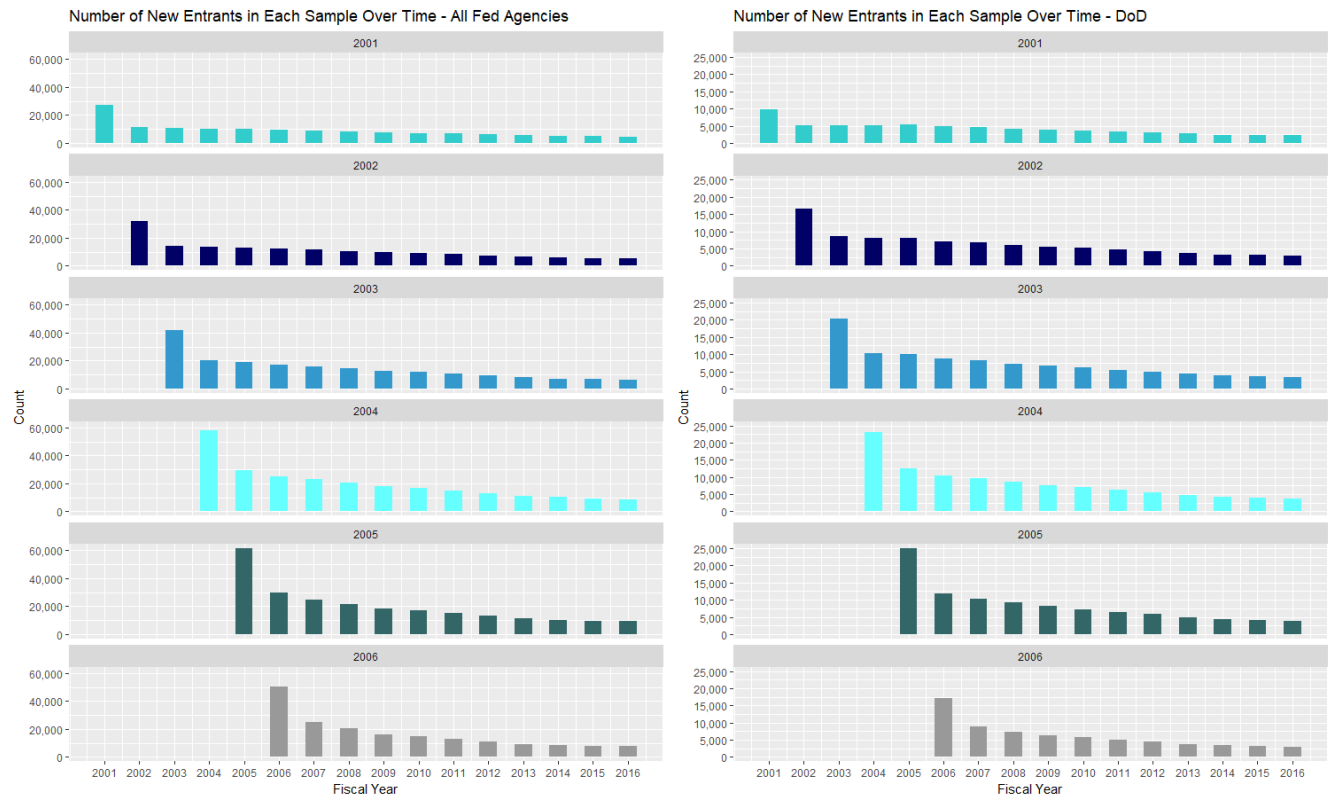


Figure 4: Number of New Entrants in Each Sample

Figure 5 displays the number of new entrants versus the number of incumbent firms in each year over the observation period for vendors working with all federal agencies and for vendors working with DoD uniquely. There are significantly more incumbent firms contracting with the federal government over the observation period as opposed to new entrants in each year. Moreover, the number of new entrants increases from 2001-2005 and then decreases from 2006-2013. Interestingly, the number of incumbent firms increases each year from 2001-2008 and then starts a downward trend in 2011. This could indicate that the cause behind the decrease in the number of total vendors over time influences new entrants earlier than it impacts incumbent firms already working with the government. Vendors working with the DoD follow similar patterns, however, a higher share of vendors working with the DoD are incumbent firms in each year.

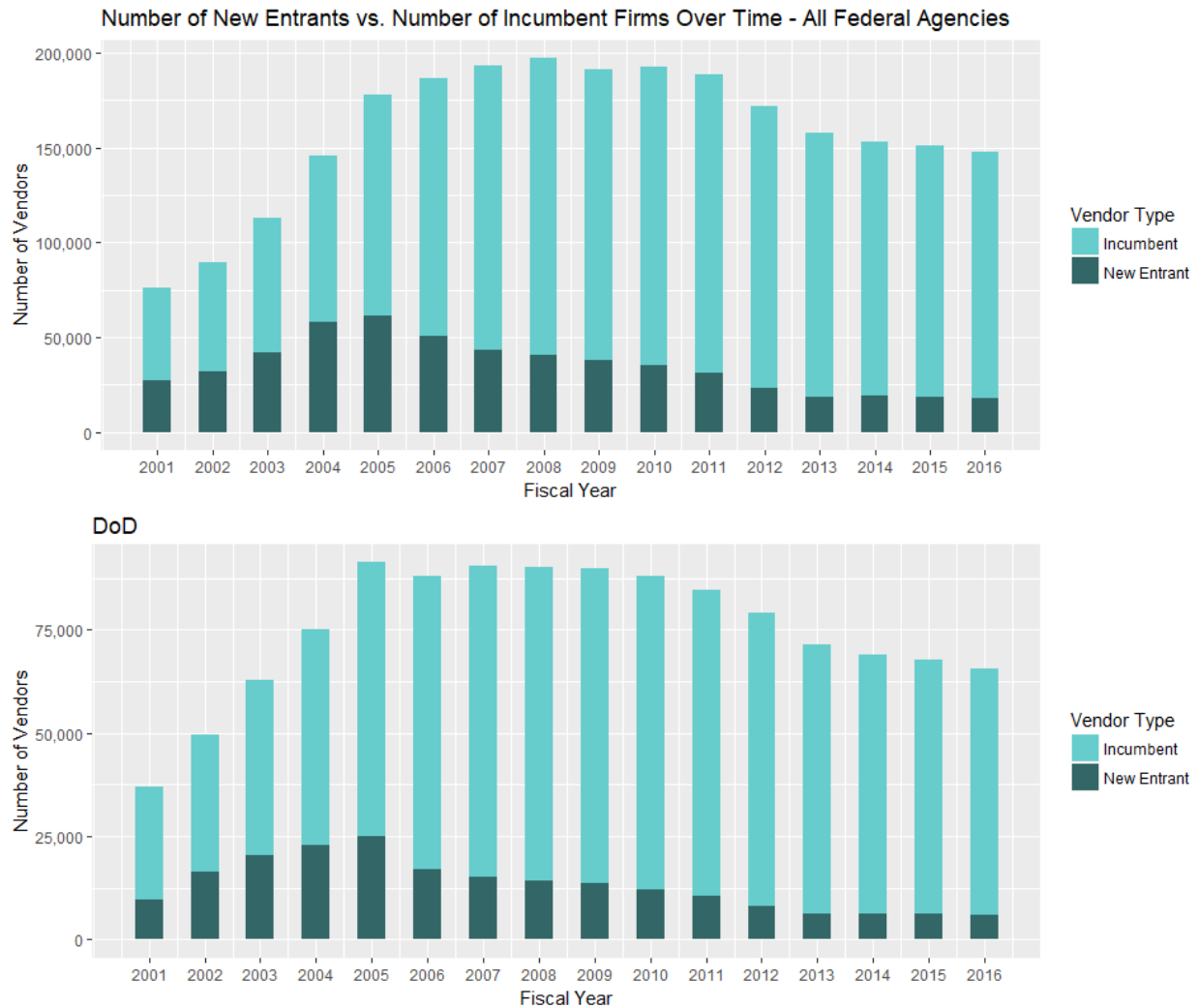


Figure 5: Number of New Entrants vs. Number of Incumbent Firms Over Time

Figure 6 displays the total obligations in 2016 dollars going to new entrants based on the year they entered the market. It sums their obligations in each year and splits these amounts by percentage rate between small and non-small new entrants. Although the number of small new entrants in the market for federal contracts over time is much greater than the number of their non-small competitors, the number of obligations going to the small new entrants in each year is much smaller than the number of obligations going to non-small new entrants. This pattern is also exhibited by the market for DoD contracts, but, in general, non-small new entrants contracting with the DoD have higher obligations than small new entrants. The decrease in obligations

from year to year amplifies the trends shown in Figures 3 and 4, because new entrants have had fewer years over which to earn obligations.

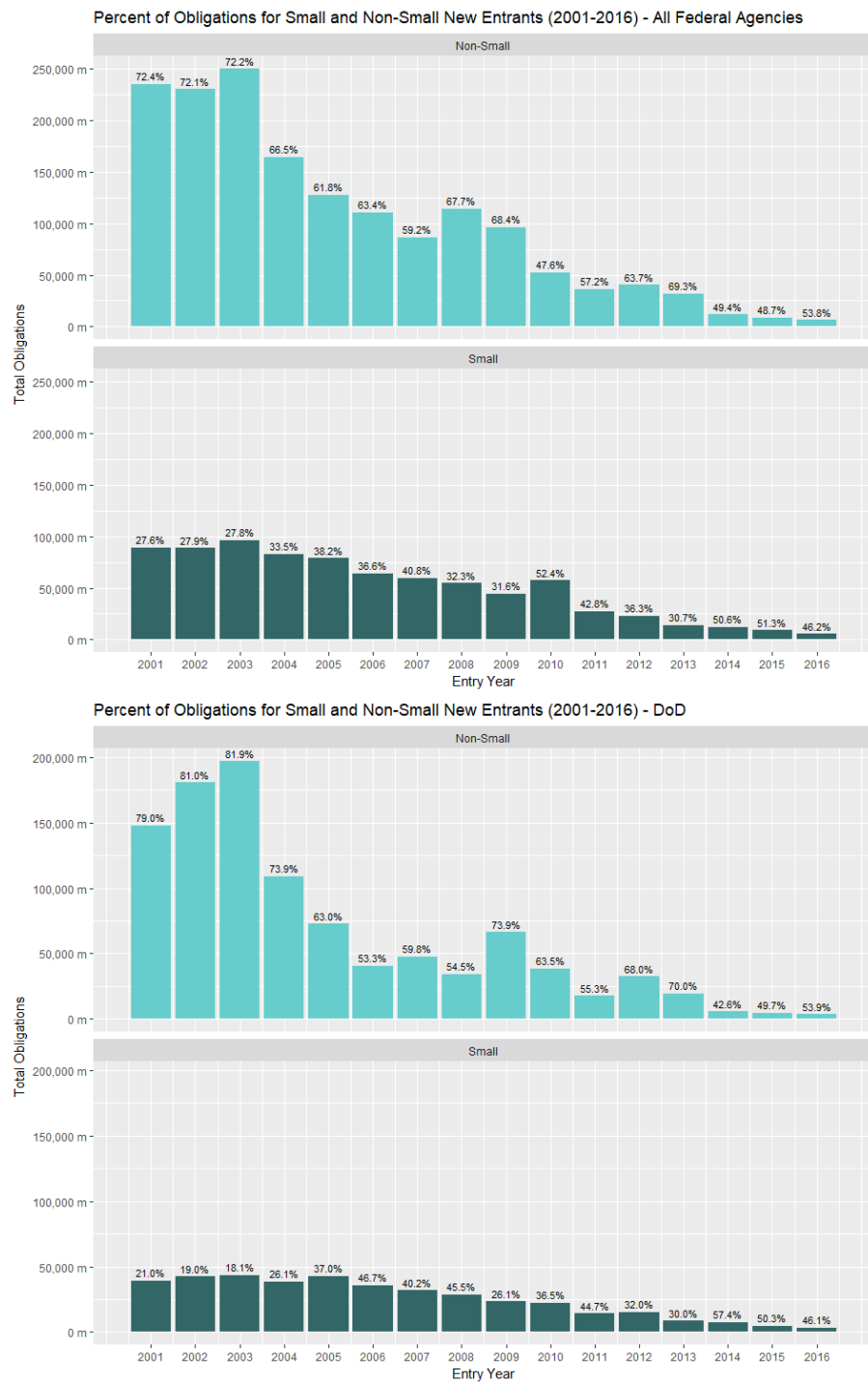


Figure 6: Percent of Obligations for Small and Non-Small New Entrants

Figure 7 compares the amount of obligations in 2016 dollars that go to incumbent firms versus the amount going to new entrants each year. Incumbent firms win a vast majority of contract obligations in every year in the observation period. Moreover, the general trends for obligations going to incumbent firms over the time period are not the same for obligations going to new entrants. The obligations going to incumbent firms in each year consistently rises from 2001 to 2009 and then decreases from 2010 to 2015. In 2016 they experience the first rise since the crest of obligations in 2009. Conversely, the obligations going to new entrants in each year vary and show no consistent trend. Interestingly, there is uni-modal jump in contract obligations to new entrants in 2010 for all federal agencies but not for DoD specifically which is surprising given the clear decrease in the number of new entrants since 2005.

The study team investigated the uni-modal peak of obligations going to new entrants in 2010 to identify whether there was an anomaly in the data. The study team found that one vendor, Coins 'N Things, was an outlier in the results causing them to show an uncharacteristically high number of obligations for new entrants in 2010. The study team did not find any indication that the obligations reported for Coins 'N Things was inaccurate nor that it would be inaccurate to include Coins 'N Things in the sample. The study team did find, however, that Coins 'N Things was classified as a small business according to the SBA's small business size determinations based on NAICS codes, which was concerning because Coins 'N Things' annual revenue in 2011 was 6.5 billion dollars.⁶⁷ Coins 'N Things operates in the Whole Sale Trade sector under "Jewelry, Watch, Precious Stone, and Precious Metal Merchant Wholesalers" which classifies small businesses as those that have less than 100 employees. Operating at around 50 employees in 2011, Coins 'N Things is classified as a small business in FPDS although its revenue in 2011 was around 6.5 billion dollars.⁶⁸

⁶⁷ Miller, K. (2011). The Family That Sells Gold to the Governmnet. Bloomberg. Retrieved from <https://www.bloomberg.com/news/articles/2011-11-03/the-family-that-sells-gold-to-the-government>

⁶⁸ Ibid.

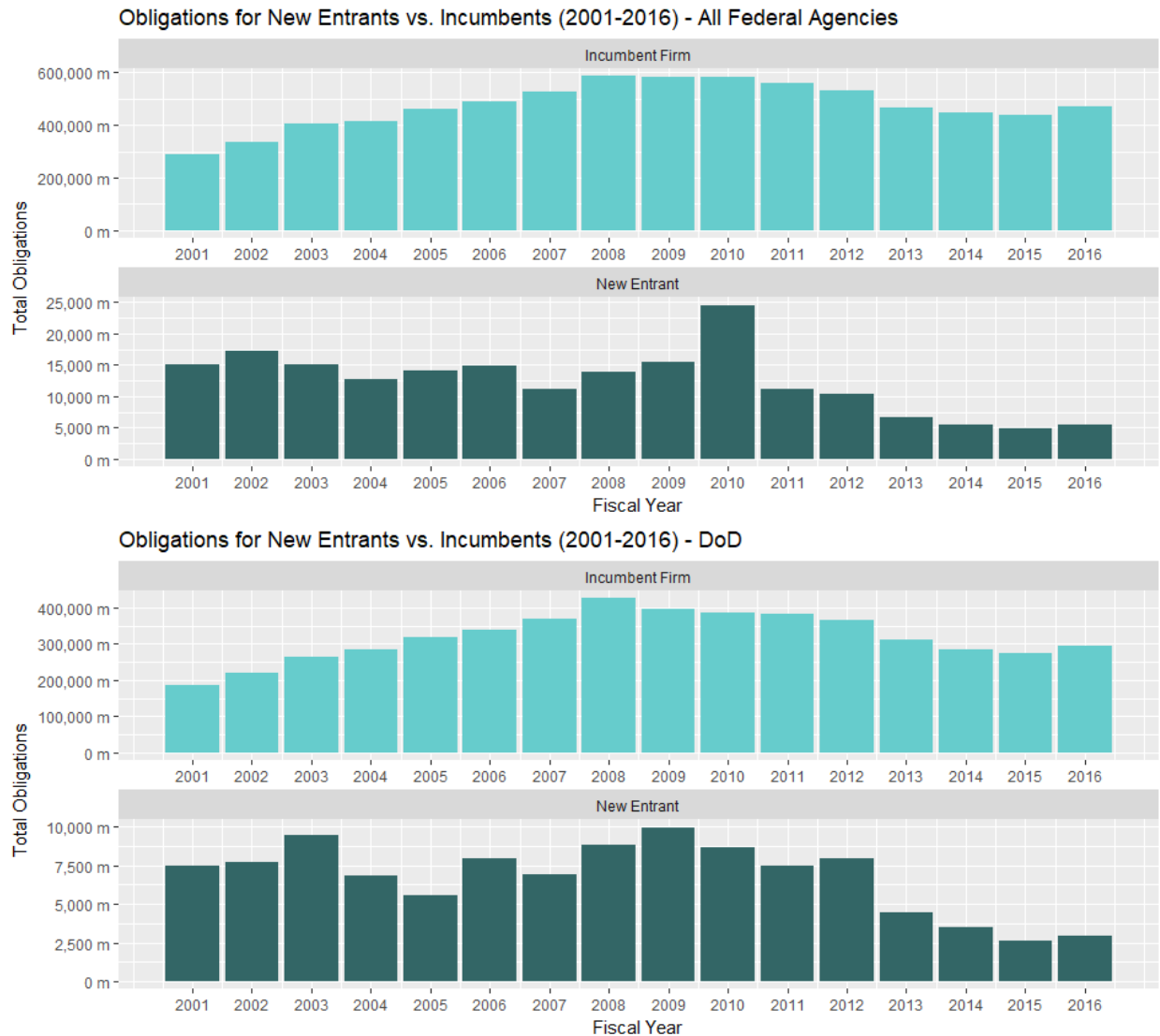


Figure 7: Obligations for New Entrants vs. Incumbents

Figure 8 examines the amount of obligations in 2016 dollars going to the new entrants in each year during the observation period for each of the six samples. The 2001-2004 samples all experience a rise in contract obligations in the middle of their observation periods. The 2002 sample peaks in 2004 where they contract the most dollars during that year and then decrease every year until the end of the observation period. The 2001 sample peaks in 2009, and the 2003 and 2004 samples peak in 2010. The 2005 and the 2006 samples win fewer dollars across all years than the other samples.

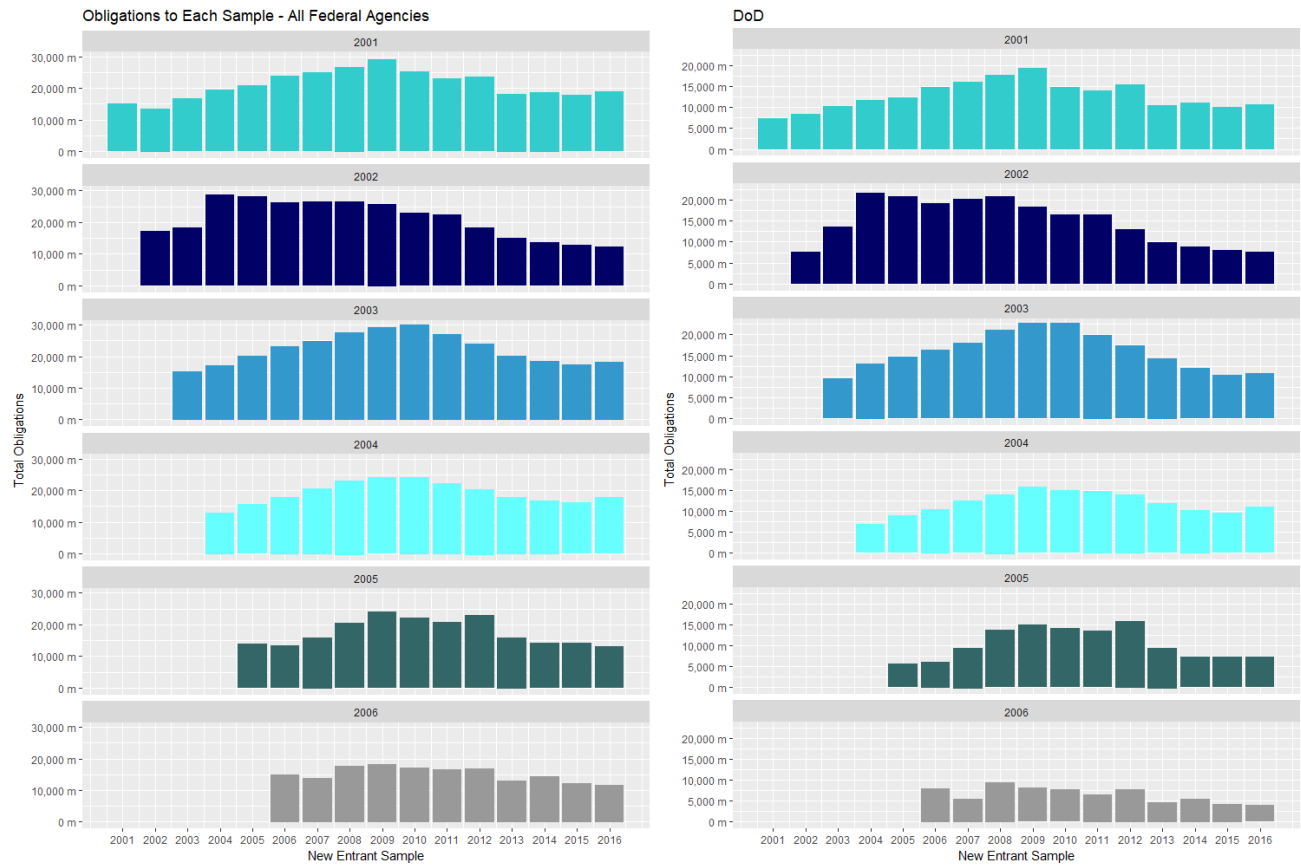


Figure 8: Obligations to Each Sample

Figure 9 examines the number of obligations in 2016 dollars that go to small new entrants that graduate during the 10-year observation period following the year of entry. Over the 10-year observation period, those small new entrants who entered the market in the baseline year and graduated from small business status tend to win more contract obligations than those small new entrants who did not graduate from small status. The sample focusing on DoD contracts specifically shows similar trends and demonstrates that small firms who graduate account for an even higher share of total obligations for each sample.



Figure 9: Percent of Obligations for Graduated and Non-Graduated New Entrants

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6. Results: New Entrants in the Market for Federal Contracts

6.1 2001 Sample of New Entrants

Table 1 reports the survival rate results for the sample of new entrants that entered the federal contracting arena in 2001 for contracts across all federal agencies and uniquely for the DoD.⁶⁹ 2001 experienced a high influx of vendors newly-minted to the federal acquisition arena, with over 27 thousand businesses contracted with a federal agency that had never done so before and around ten thousand of those contracted with the DoD specifically. Of those 27 thousand, about 19 thousand were flagged as small and around nine thousand as non-small, as defined by the SBA.

The differences between small and non-small new entrants' survival rates are nearly all significantly different from zero indicating that there could be a systematic relationship between size and the ability for new entrants entering the federal contracting arena in 2001. The one exception is for the 2016 survival rates, where the difference between the number of small and non-small new entrants who survived in 2016 is not significantly different. About 60 percent of new entrants survive as federal contractors after 3 years, around 50 percent are still in the market after 5 years, and close to one third remain 10 years after entering the market. Looking forward to the most recent data, the survival rate drops to nearly 20 percent in 2016.

While the market for DoD contracts exhibits similar patterns, the graduation rate for small business new entrants contracting with the DoD is higher than for small business new entrants across all federal agencies. The graduation rate for small new vendors working with the DoD is around 13 percent, while small new vendors contracting across all federal agencies exhibit around an 11 percent graduation rate. Figure 10 visually shows these survival and graduation rates across all, small, and non-small vendors that entered the market for federal contracts in 2001. While only 11 and 13 percent of small new vendors graduate from small business status during the 10-

⁶⁹ ***, **, or * indicates a p-value of less than .001, .01 or, .1, respectively.

year observation period, this is close to one third of the initially small new entrants that survived after 10 years.

Table 1: 2001 New Entrants' Survival Rates								
All Federal Agencies					DoD			
	All New Entrants	Small New Entrants	Non-Small New Entrants	T-test diff between small and non-small		All New Entrants	Small New Entrants	T-test diff between small and non-small
Observations	27,433	18,780	8,653		Observations	10,471	7,333	
3-Year	62.94%	63.89%	60.89%	-4.8***	3-Year	68.88%	69.10%	-0.7
5-Year	51.72%	53.27%	48.38%	-7.5***	5-Year	59.58%	59.68%	-0.3
10-Year	34.42%	35.48%	32.05%	-5.5***	10-Year	39.69%	40.04%	-1.1
2016	19.08%	19.22%	18.79%	-0.8	2016	21.85%	21.41%	1.7*
Graduation Rate		11.23%			Graduation Rate		13.48%	

Source: FPDS

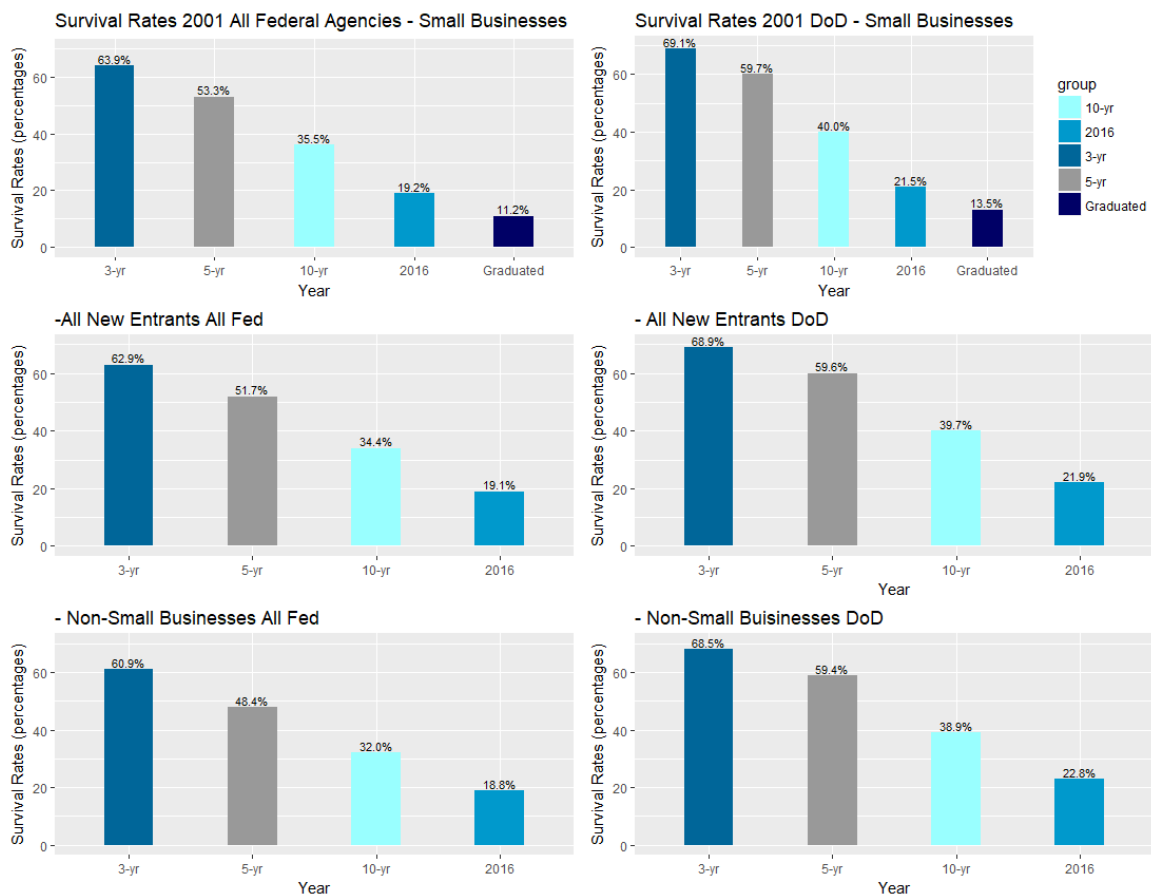


Figure 10: 2001 Survival Rates

6.2 2002 Sample of New Entrants

Table two reports the results for the sample of vendors that entered the federal contracting arena in 2002. There were slightly more new entrants in 2002 than 2001, both across all federal agencies and for the DoD, with around 34 thousand new businesses began contracting with a federal agency. Of those 34 thousand, around 25 thousand were small and just over nine thousand were classified as non-small. Specific to DoD, around 12 thousand were small while four thousand were non-small. The differences between small and non-small businesses in their ability to survive 3, 5, and 10 years are significantly different across all federal agencies and the DoD. While there is no significant difference between small and non-small businesses survival rates in 2016 across all federal agencies, non-small new entrants significantly survived at a higher rate in 2016 than their small competitors in the market for DoD contracts.

The 2002 sample of new entrants exhibits similar survival rate patterns to the 2001 sample of new entrants. For all federal agencies, small new entrants tend to have higher 3-, 5-, and 10-year survival rates at around 65, 54, and 34 percent, respectively. For those new entrants contracting with the DoD, however, small new entrants have slightly lower 3-, 5-, and 10-year survival rates in addition to having a lower survival rate in 2016. These survival rates for new entrants contracting specifically with the DoD are generally higher than the survival rates for new entrants contracting with all federal agencies. The differences between small and non-small new entrants contracting with the DoD are significantly different from one another for all survival rates, including the 2016 rate.

Small new entrants contracting with the DoD have higher graduation rates than the sample of new entrants contracting with all federal agencies, at around 14 percent, which means that nearly one third of the new entrants that began as small in 2002 and survived ten years graduated. Figure 11 displays a visualization of these survival and graduation rates across all, small, and non-small new entrants.

Table 2: 2002 New Entrants' Survival Rates								
All Federal Agencies					DoD			
	All New Entrants	Small New Entrants	Non-Small New Entrants	T-test diff between small and non-small		All New Entrants	Small New Entrants	T-test diff between small and non-small
Observations	34,193	24,867	9,326		Observations	16,633	12,605	
3-Year	63.59%	64.74%	60.54%	-7.1***	3-Year	69.17%	68.32%	4.3***
5-Year	52.52%	53.58%	49.72%	-6.4***	5-Year	57.41%	56.89%	3.9***
10-Year	33.61%	33.91%	32.81%	-1.9*	10-Year	36.91%	36.16%	3.6***
2016 Graduation Rate	18.63%	18.63%	18.64%	0.2	2016 Graduation Rate	21.13%	20.37%	4.2***
		10.30%					13.56%	

Source: FPDS

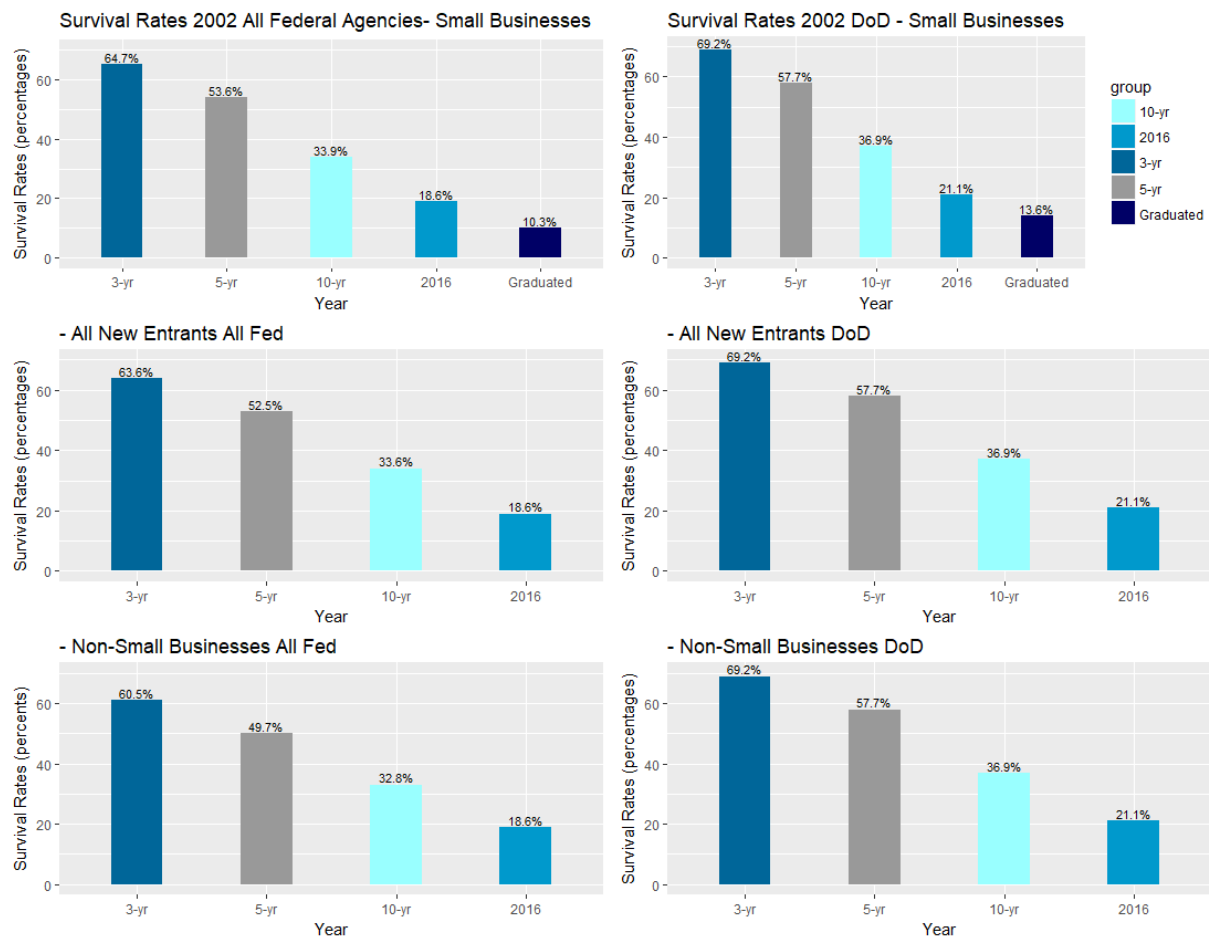


Figure 11: 2002 Survival Rates

6.3 2003 Sample of New Entrants

The survival and graduation rates for the sample of new vendors that entered the federal contracting arena in 2003 are displayed in table 3. The number of new entrants in the market for federal contracts continued to rise, with just over 45,000 vendors beginning to contract with the federal government in 2003 and just under half of those engaged in contracts with the DoD specifically. Although the survival rates for new entrants in 2003 are similar to those vendors that entered the market for federal contracts in 2002, they are, on average, slightly lower, especially for the graduation rates. The number of small new entrants contracting across all federal agencies and with the DoD rose to nearly 33 thousand and 16 thousand, respectively.

For new entrants working across all federal agencies, small new entrants tend to have higher survival rates than their non-small competitors. These differences are all significant except for in 2016. Conversely, the sample of vendors contracting with the DoD tend to have higher survival rates for non-small vendors than small vendors. The survival rates of these two groups are significantly different for 3-year and 5-year; however, there is no statistical support for a difference in survival rates between the two groups for the 10-year or 2016 survival rates. While around 60 percent of the 2003 new entrants survive after 3 years, only 30 percent make it to the 10-year mark, and less than 20 percent exist in the market for federal contracts in 2016. The graduation rates for the 2003 sample of new entrants decreases from previous years where around 9 percent of the small new entrants working with both all federal agencies and the DoD in 2003 graduated from small business status. In other words, less than one third of the small new entrants that survived 10 years graduated from small business status.

Table 3: 2003 New Entrants' Survival Rates									
All Federal Agencies					DoD				
	All New Entrants	Small New Entrants	Non-Small New Entrants	T-test diff between small and non-small		All New Entrants	Small New Entrants	Non-Small New Entrants	T-test diff between small and non-small
Observations	45,250	32,983	12,267		Observations	20,969	15,887	5,082	
3-Year	62.98%	63.87%	60.59%	-6.4***	3-Year	65.72%	64.71%	68.89%	5.6***
5-Year	51.41%	52.15%	49.40%	-5.2***	5-Year	53.66%	53.04%	55.61%	3.2***
10-Year	29.52%	29.86%	28.59%	-2.7*	10-Year	31.57%	31.33%	32.33%	1.3
2016	18.17%	18.30%	17.82%	-1.2	2016	19.23%	19.10%	19.66%	1.0
Graduation Rate		8.67%			Graduation Rate		9.23%		

Source: FPDS

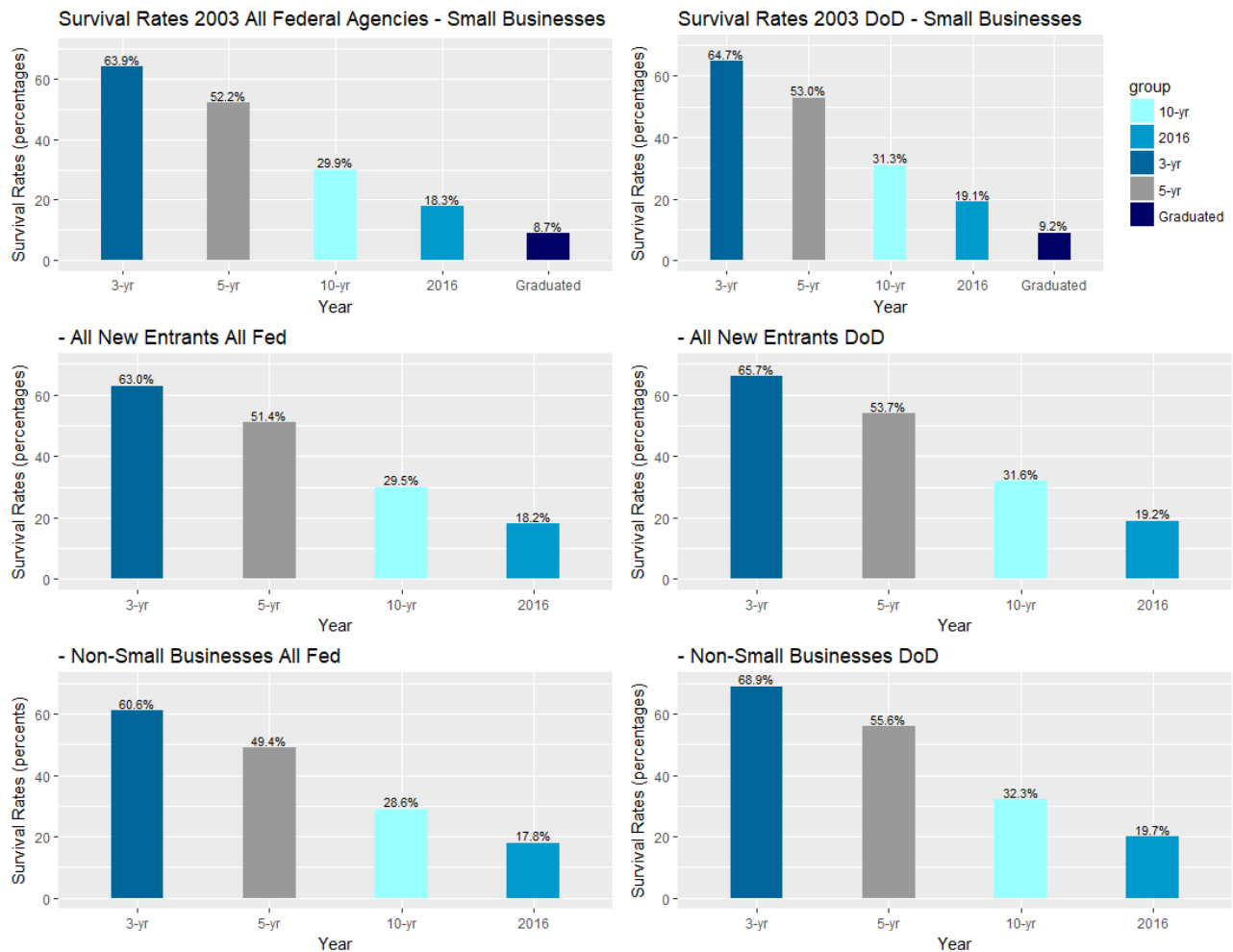


Figure 12: 2003 Survival Rates

6.4 2004 Sample of New Entrants

The survival and graduation rates for the sample of vendors that entered the market for federal contracts in 2004 are displayed in Table 4. The total number of new vendors entering the federal contracting arena continues to rise, with over 57 thousand businesses starting to contract with all federal agencies and 22 thousand of those working with the DoD specifically. The survival and graduation rates, however, slightly decrease from previous years. The differences in survival rates between small and non-small new entrants are significant for both the sample working across all federal agencies and the sample working with the DoD specifically, with the exception of the 2016 survival rates.

Small new entrants working across all federal agencies have a much higher 3-year survival rate than their non-small competitors. Although they maintain a higher rate of survival for the other years, the magnitude of difference compared to their non-small competitors is not as large. Furthermore, the DoD-unique sample also shows higher survival rates for small new entrants than their non-small competitors for all years. The difference is around two percentage points across all years of evaluation. All samples' 3-year survival rates rest around 60 percent and decrease to around 18 percent in 2016. Figure 13 visualizes these survival rates across the samples. The graduation rates for all federal agencies and for the DoD are nearly identical, at around 7 percent. In other words, around one fourth of the small new entrants that survived for 10 years graduated from small business status.

Table 4: 2004 New Entrants' Survival Rates									
All Federal Agencies				DoD					
	All New Entrants	Small New Entrants	Non-Small New Entrants	T-test diff between small and non-small		All New Entrants	Small New Entrants	Non-Small New Entrants	T-test diff between small and non-small
Observations	57,486	42,190	15,296		Observations	22,381	16,830	5,551	
3-Year	58.94%	60.80%	53.80%	-15.0***	3-Year	61.08%	61.69%	59.27%	-3.2**
5-Year	42.05%	43.06%	39.25%	-8.2***	5-Year	43.08%	43.76%	41.06%	-3.5***
10-Year	26.58%	27.13%	25.07%	-5.0***	10-Year	26.83%	27.43%	25.06%	-3.5***
2016	18.00%	18.12%	17.66%	-1.3	2016	18.00%	18.24%	17.29%	-1.6
Graduation Rate		7.49%			Graduation Rate		7.37%		

Source: FPDS

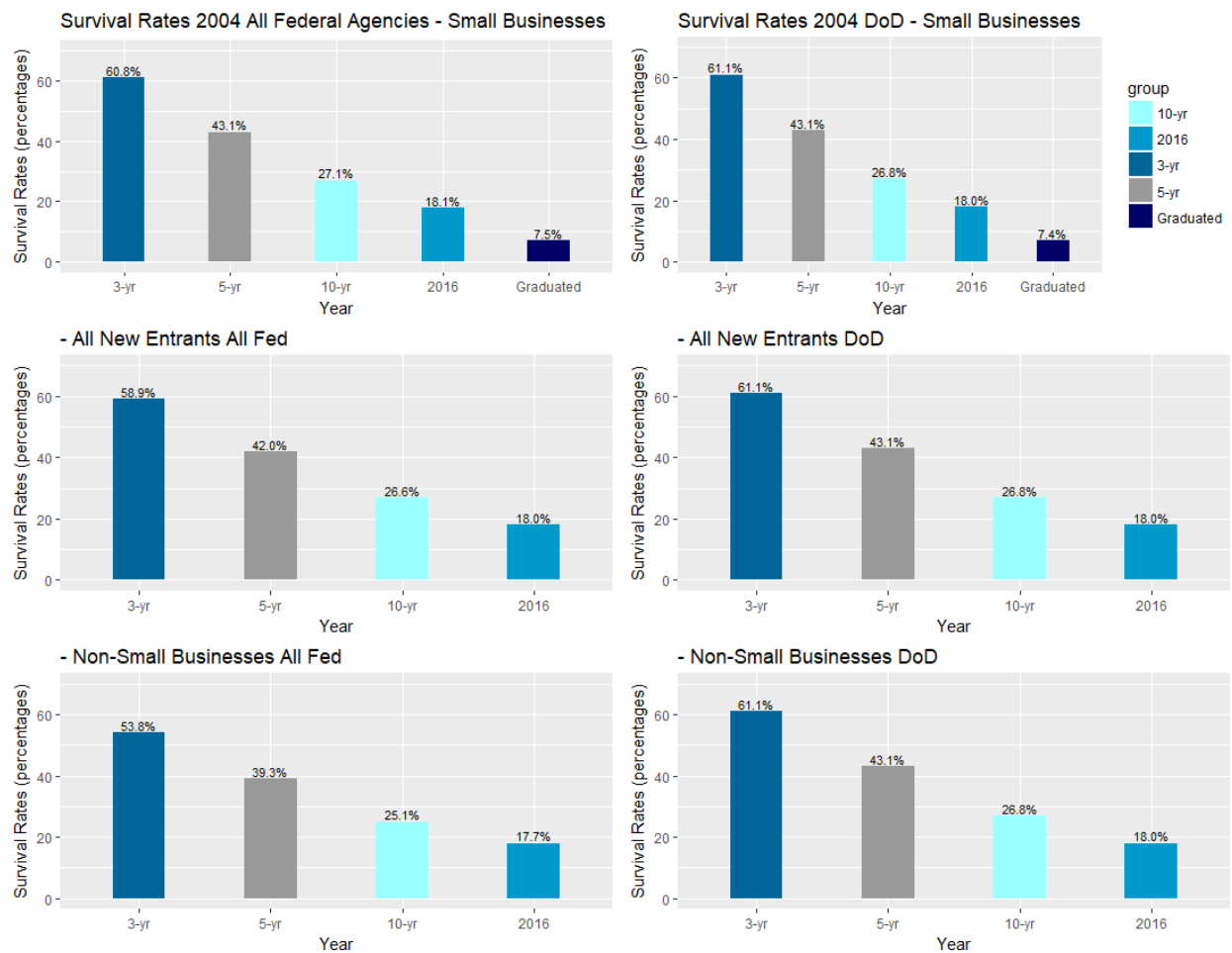


Figure 13: 2004 Survival Rates

6.5 2005 Sample of New Entrants

Table 5 displays the survival and graduation rates for the sample of new entrants that began contracting with the federal government in 2005. The total number of new entrants in 2005 was around 58 thousand, which barely increases from the number that entered in 2004. Just under one third of those new entrants contracted with the DoD specifically. There continues to be a much larger number of small new entrants than non-small new entrants, with around 44 thousand small new entrants contracting with all federal agencies and nearly 17 thousand small new entrants contracting with the DoD specifically.

The survival rates for new entrants working with all federal agencies and the survival rates for those working with the DoD are slightly smaller than the 2004 sample. While small new entrants contracting with all federal agencies have a higher 3-year survival rate than non-small new entrants, the 5-year, 10-year, and 2016 survival rates are higher for non-small new entrants. Conversely, all survival rates are higher for small new entrants working with the DoD than non-small new entrants working with the DoD. The difference in survival rates between small and non-small businesses are statistically significant across both samples, except for the 5-year survival rate for new entrants contracting across all federal agencies. The graduation rates continue to decline, with around 6 percent of small new entrants that began contracting with the federal government in 2005 graduating from small business status. This is about one fourth of the small businesses that survive 10 years. These trends are visually displayed in Figure 14.

Table 5: 2005 New Entrants' Survival Rates								
All Federal Agencies					DoD			
	All New Entrants	Small New Entrants	Non-Small New Entrants	T-test diff between small and non-small		All New Entrants	Small New Entrants	T-test diff between small and non-small
Observations	58,224	44,558	13,666		Observations	22,481	16,776	
3-Year	58.18%	58.58%	56.89%	-3.4***	3-Year	56.94%	57.92%	-5.0***
5-Year	40.60%	40.47%	41.02%	1.1	5-Year	38.70%	39.87%	-6.2***
10-Year	25.22%	24.97%	26.04%	2.5**	10-Year	23.20%	24.33%	-7.1***
2016	19.29%	18.90%	20.56%	4.2***	2016	17.28%	18.09%	-5.7***
Graduation Rate		6.25%			Graduation Rate		6.24%	

Source: FPDS

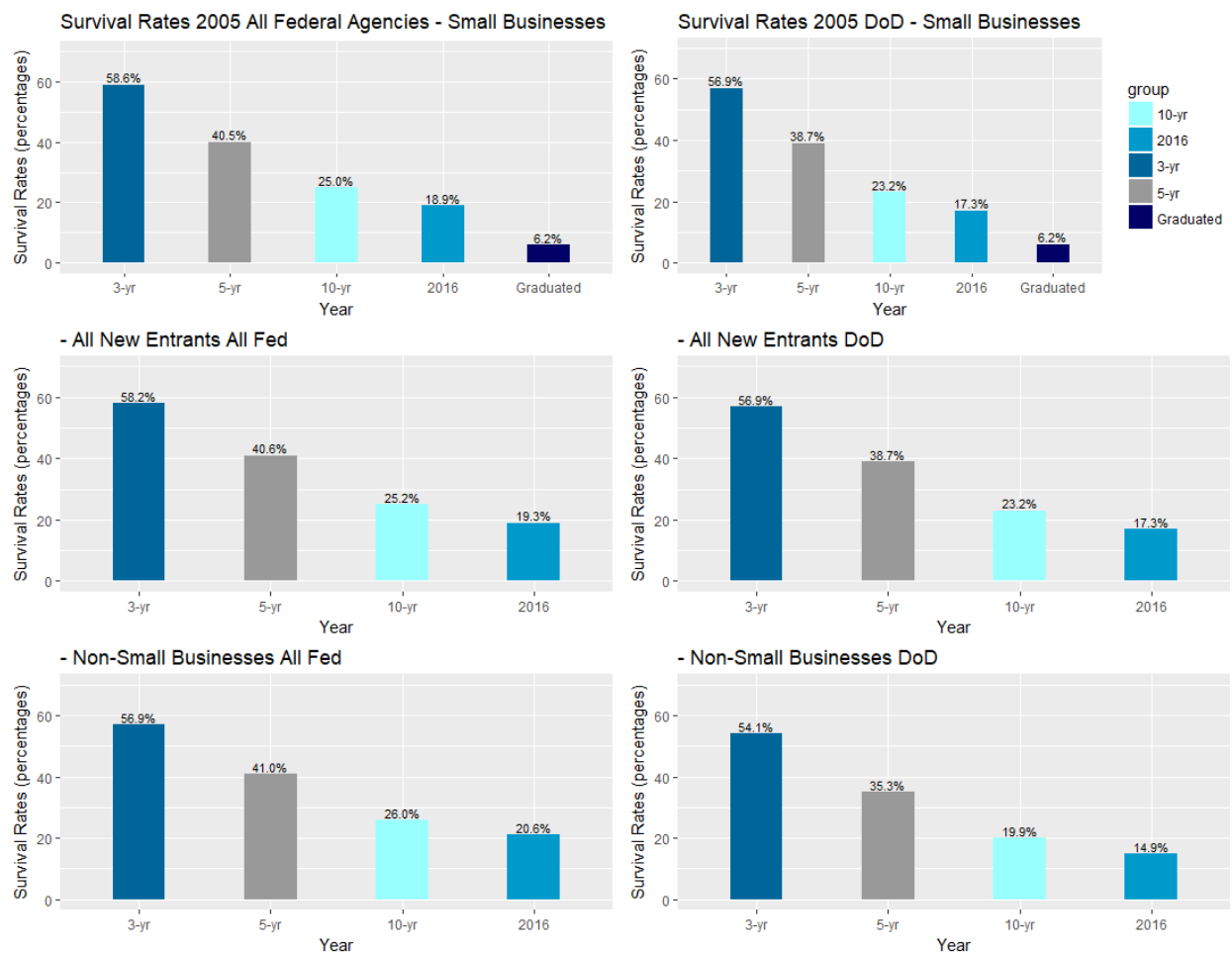


Figure 14: 2005 Survival Rates

6.6 2006 Sample of New Entrants

Table 6 displays the survival and graduation rates for the sample of new entrants that entered the federal contracting arena in 2006. For the first time, the number of new entrants entering this market decreases from the previous year. Whereas in 2005 there were 58 thousand new entrants, in 2006 only 48 thousand entered the market. This number is closest to the number of new entrants that entered the market in 2003. Of the 48 thousand new entrants in 2006, more than half were small. Close to 16 thousand of these vendors contracted with the DoD specifically, and over half of that sample were small. The survival rates for all samples are continually slightly smaller than those firms who entered the market in the previous year. Furthermore, the differences in survival rates between small and non-small vendors working with all federal agencies are statistically significant, while the differences between small and non-small vendors working with the DoD are only statistically significant for the 3-year rate. In general, non-small new entrants had higher survival rates for both samples.

The graduation rate for small new entrants working across all federal agencies is just over 5 percent, while the graduation rate for small new entrants working with the DoD is just over 6 percent. These rates continue the decline in graduation rates across samples from 2001. Similar to 2005, however, about one fourth of the small new entrants working for all federal agencies graduated from their small business status if they survived 10 years and this proportion is slightly higher for small new entrants working with the DoD. These survival and graduation rates are visually reported in Figure 15.

Table 6: 2006 New Entrants' Survival Rates								
All Federal Agencies					DoD			
	All New Entrants	Small New Entrants	Non-Small New Entrants	T-test diff between small and non-small		All New Entrants	Small New Entrants	T-test diff between small and non-small
Observations	48,415	38,396	10,019		Observations	15,624	11,731	3,893
3-Year	57.60%	56.90%	60.32%	6.2***	3-Year	55.75%	55.07%	57.85% 3.0**
5-Year	38.00%	37.19%	41.10%	7.1***	5-Year	36.82%	36.83%	36.81% -0.3
10-Year	21.69%	21.17%	23.70%	5.4***	10-Year	21.10%	20.91%	21.71% 1.2
2016	18.21%	17.68%	20.23%	5.7***	2016	17.67%	17.47%	18.31% 1.2
Graduation Rate		5.48%			Graduation Rate		6.26%	

Source: FPDS

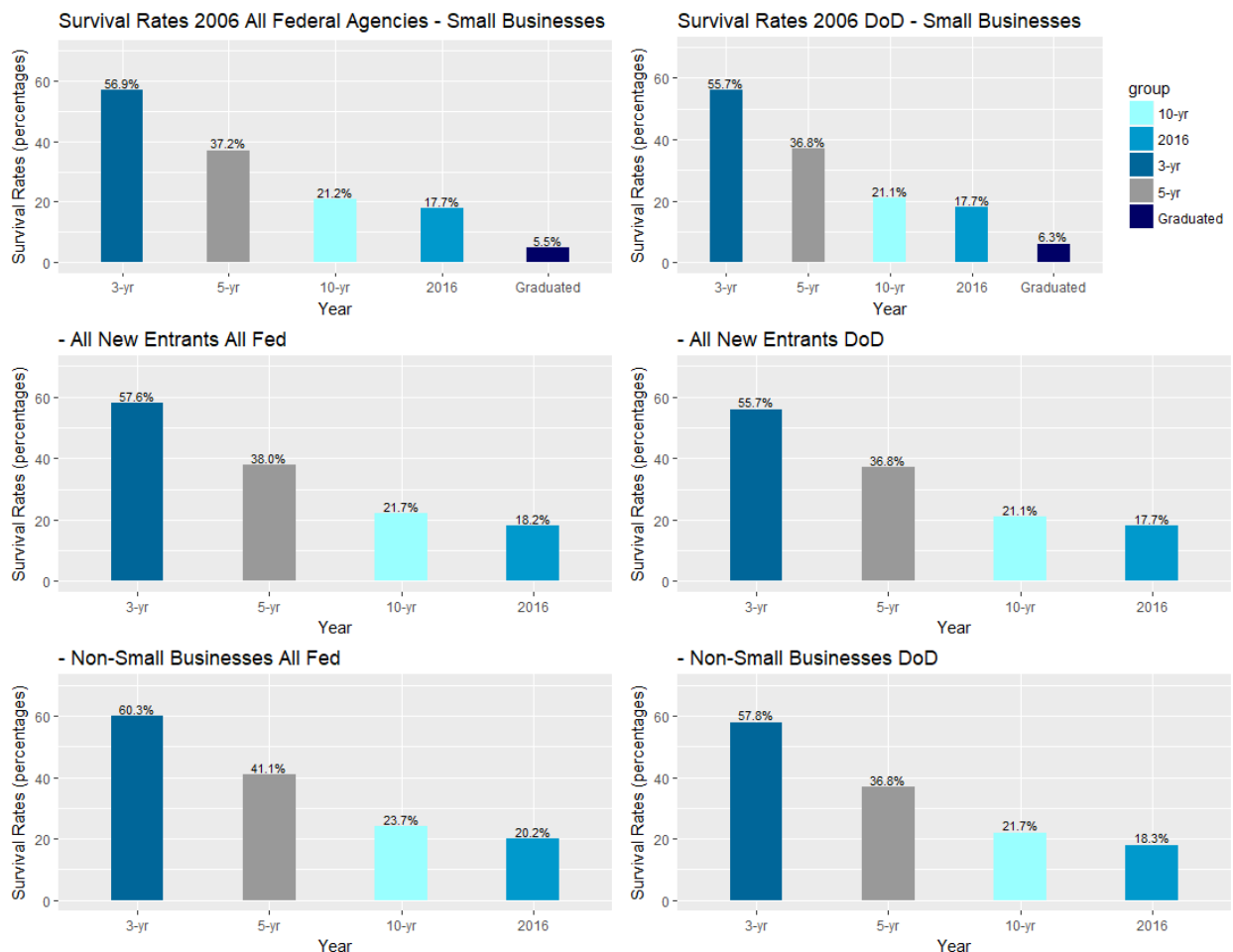


Figure 15: 2006 Survival Rates

7. Discussion

7.1 New Entrant Counts

Over the observation period, the count of vendors entering the federal contracting arena varies. From 2001 to 2005, there had been a build-up of federal vendors new to government contracting. Starting in 2006, however, the number of vendors beginning to contract with the federal government had started to decline each year until 2013, where the number of new entrants each year stays mainly constant through the end of the observation period. New entrants to the market for DoD contracts show similar trends. Additionally, there are consistently larger counts of small new entrants than non-small new entrants throughout the observed time period.

The largest influx of new entrants to the federal contracting arena occurs in 2003 and 2004. This occurred simultaneously with the opening stages of U.S. military operations in Iraq. The increase of new entrants into the DoD contracting arena during this time is slightly more dramatic than for all federal agencies, signaling that there could be a link between the beginning of the U.S.-Iraq war and the number of new entrants contracting with the DoD, where during this time period a higher supply of government contracts attracted a greater number of new vendors. Additionally, federal expenditure data shows that while the trends for both federal expenditures and DoD expenditures increased during this period, DoD expenditures rose at a higher rate.⁷⁰ This increase in DoD expenditures could be another contributing factor to the rise of new entrants in 2003 and 2004.

After this initial buildup of new entrants, the number of firms entering the federal contracting arena began to dramatically decline in 2006, and this trend continues at a decreasing rate until 2013. This trend in new entrants, however, departs from federal spending, because in 2006 and 2007, the government's rate of expenditure growth

⁷⁰ FRED Economic Data. (2017). Government current expenditures: Federal: National defense. Retrieved from <https://fred.stlouisfed.org/series/G160461A027NBEA>; FRED Economic Data. (2018). Government total expenditures. Retrieved from <https://fred.stlouisfed.org/series/W068RC1A027NBEA>

increased, especially for the DoD.⁷¹ Interestingly, the decline in new entrants that are entering the federal contracting arena precedes the great recession by two years, and this decline continues at a relatively constant rate from 2007 to 2012. A report by the Kauffman Foundation found that the index of growth for entrepreneurship in the U.S. economy dramatically decreased from 2008-2011 and then recovered through 2014, where it has since remained relatively constant.⁷² The index of growth for entrepreneurship initially seems to mirror the decline of new entrants in the federal contracting arena from 2008 to 2011. However, this leaves two facets of federal contracting trends unexplained. Firstly, what caused the rapid decrease in new entrants from 2006 to 2008, and secondly, why did the rate of new entrants in the federal contracting arena not follow wider-economic trends and increase after 2011? The answer to the latter question could potentially be linked to the Budget Control Act of 2011 and ensuing sequestration, which limited the amount of federal spending.⁷³ These events could have acted as a discouraging signal to non-traditional federal vendors who were potentially interested in entering the federal contracting arena.

Since 2012, there have consistently been low levels of new entrants in the federal contracting arena. As of 2015, however, the government has implemented novel initiatives (such as DIUx) that aim to attract non-traditional federal contracting vendors to the market for DoD contracts. The rapid rise of the tech industry, coupled with the decrease in new entrants contracting with the federal government over the past decade has served as a warning to the DoD, signaling its failure to effectively utilize desirable facets of industry. These efforts are narrowly targeted, and even in the best-case scenario they are unlikely to bring in a high magnitude of new entrants. Instead, higher graduation rates could reflect the successful outcomes of these efforts, which could be a signal that there is a high potential for growth for firms wanting to enter and thrive in the federal market. Although this paper's results suggest that the effects of efforts such

⁷¹ Ibid.

⁷² Kauffman Foundation. (2017). 2017 Kauffman Index Growth Entrepreneurship National Trends. Retrieved from <https://www.kauffman.org/kauffman-index/reporting/growth-entrepreneurship>

⁷³ McCormick, R., Hunter, A. P., & Sanders, G. (2017). *Measuring the Impact of Sequestration and the Drawdown on the Defense Industrial Base*. Rowman & Littlefield. Retrieved from https://csis-prod.s3.amazonaws.com/s3fs-public/publication/180111_McCormick_ImpactOfSequestration_Web.pdf?A10C65W9Qkx07VaJqYcJguCH.7EL3O7W

as DIUx might not yet be realized, the DoD is continually working towards attracting non-traditional vendors, and it will be interesting to track the trends of new entrants in upcoming years.

7.2 Survival and Graduation Rates

The survival rates presented in the results section of this paper serve to answer the first three research questions posed by the research team. In the market for federal and DoD contracts, the 3-, 5-, and 10-year survival rates decrease at similar rates across the six samples examined by the study team. Moreover, all six samples experience similar rates of survival in 2016, which for the 2001 sample is essentially a 16-year survival rate and for the 2006 sample is essentially an 11-year survival rate. Thus, the smaller margin between the 10-year and 2016 survival rates for the 2006 sample compared to the margin between the 10-year and 2016 survival rates for the 2001 sample follows logical sense. This result helps justify the study team's reason for limiting the observation periods of the six samples to 10 years, because it confirms that doing so can better gauge how representative the patterns from one sample are to the greater population of new entrants in the market for federal contracts. Since the survival rates do not vary greatly across the samples over time, each sample could be a valid representation of new entrants in the federal contracting arena in general. Moreover, since each of the six samples of new entrants examined in this study follows a similar pattern in their rates of survival over different time periods, federal contractors can more confidently use these trends when evaluating and formulating contracting policy.

The trends show that in general, around 40 percent of new entrants exit the market for federal contracts after three years, around 60 percent after five years, and only about one fifth of new entrants remain in the federal contracting arena after 10 years. These survival rates are fairly consistent with the results from other studies that calculate the survival rates of new entrants in other sectors of the economy and at different time periods. While other scholarship studying survival rates vary greatly across observation periods and industrial sectors, the results of a recent project looking at new firms that entered the economy in 2011 reflect the findings from the broader body of literature. This project compared its results with a previous study, that looked at

a sample of firms that entered the economy in 2005, right before the recession.⁷⁴ The firms entering the economy in 2005 exhibited five-year survival rates between 36 and 51 percent. The firms entering the market in 2011 exhibited five-year survival rates between 44 and 66 percent. Both samples analyzed survival rates across nine industrial sectors.⁷⁵

7.2.1 Relationship of Business Size and Survival

To answer the third research question posed by the study team, the survival rates between small and non-small new entrants are compared. This paper's results differ from what has already been found in the literature that has focused on comparing survival rate trends between small and non-small new entrants. The existing body of literature that focuses on studying the effects of size on new entrants in various sectors of the economy has come to the consensus that large new entrants have higher survival rates than their smaller competitors. The results of this paper show that this is not always the case for new entrants in the market for federal contracts.

Small business new entrants exhibit higher survival rates than their non-small competitors when contracting across all federal agencies for the 2001, 2002, 2003, and 2004 samples. In 2005, small new entrants only have higher survival rates after three years, and non-small new entrants survive at higher rates for the other survival rates examined. These differences between small and non-small new entrants are all statistically different from zero, indicating that there could be a systematic variation between small and non-small businesses' ability to sustain themselves as vendors in the federal contracting arena. Conversely, small new entrants that are specifically in the market for DoD contracts perform better than their non-small competitors in 2004 and 2005. The other years either show that non-small new entrants have higher survival rates when working with the DoD (2002 and 2003) than their non-small competitors, or the two samples are not significantly different from zero.

⁷⁴ Shane, S. (2008). *The Illusions of Entrepreneurship The Costly Myths that Entrepreneurs, Investors, and Policy Makers Live By*.

⁷⁵ Deutsch, W. (2017). *Surprising numbers behind start-up survival rates*. Retrieved from <http://review.chicagobooth.edu/entrepreneurship/2017/article/surprising-numbers-behind-start-survival-rates>

The 2016 survival rates between small and non-small new entrants tended to not be significantly different from each other, which could indicate that small businesses that failed to graduate might lose their small business set aside advantages, or that they were acquired by larger companies and were no longer included in the sample. For instance, the 8(a) Business Development Program administered by the SBA is only available to small businesses for nine years. Thus, if participants of this program do not graduate from small business status within the nine-year timeframe, they will lose their support within federal contracting and might not be able to maintain their business with the government. Or, they could have been bought up by larger corporations, which is sometimes a goal for small businesses. The analysis in this study does not track mergers or acquisitions directly. Mergers and acquisitions can result in changed business size or the discontinuation of a given duns number, but, because of indirect observation, these outcomes are unclear, and this should be a topic of consideration in future work.

Although the analyses conducted by the study team cannot definitively conclude what drives the systematic difference between small and non-small new entrants in the market for federal contracts, there are outside factors that make a compelling hypothetical argument for supporting these relationships. Small business policies are the most likely cause for the fact that small businesses tend to have higher survival rates than their non-small competitors when contracting with all agencies of the federal government. As previously discussed, there are many legal and regulatory mechanisms in place for promoting small businesses that are in the market for government contracts. This could be driving the higher success rates of small businesses in the federal contracting arena, which diverges from the conclusions made in the established literature. Interestingly, there are different patterns in the market for DoD contracts specifically. Although the sample of small new entrants entering the market for DoD contracts in 2004 and 2005 have higher survival rates than their non-small competitors, non-small new entrants do better than their small competitors for the samples entering the market for DoD contracts in 2002 and 2003. Traditionally, the high regulatory barriers to entry coupled with the highly concentrated weapons industry make DoD

contracting less accessible for small businesses and thus could be some of the factors contributing to these results.

7.2.2 Graduation

To answer the final research question posed by the study team, the graduation rates for small business new entrants are considered. On the one hand, these results suggest that small business policy successfully aids newly entered small businesses, because they tend to survive at higher rates than newly entered non-small firms in the market for all federal agencies (and occasionally for the DoD specifically). On the other hand, this could imply that small businesses face a perverse incentive regarding their business model. Although these results suggest that small businesses tend to survive more often than their non-small competitors when contracting across all federal agencies, the low rates of graduation of small businesses in this realm are concerning. Across the samples from 2001 to 2006, the graduation rates of small businesses consistently decrease. While in 2001, around 12 percent of small businesses that survive ten years graduate from small business status, in 2006, around 6 percent of small businesses that survive ten years graduate from small business status. This could indicate the existence of a contracting cliff in the federal contracting arena.

These results are concerning because growing firms produce the most jobs and provide more competition, as they have reached minimum efficient scale for a wide range of products and services, therefore fulfilling one of the goals of the small business promotion system. However, if the likelihood of survival in the market for federal contracts decreases as a firm grows, newly entered firms contracting with the federal government might not pursue a business model of profit maximization through growth, because they would lose their small-business set aside privileges, which would inhibit their ability to contract with the government. As can be seen in Figure 9, graduating firms win most of the contract obligations over the study period for each sample. This suggests that growth to the point of graduation from small-business status results in desirable business outcomes such as higher participation in the market. Thus, while growth does matter for small-business new-entrants' success in the market, their ability

to survive after growth is uncertain, which means that small-business policy incentives are misaligned from the small-business economic goals.

Policymakers should pay attention to these perverse incentives when working with small businesses. These results imply that the small business policies that aim to aid small businesses in contracting with the government could be successful; however, the benefits of these policies may be exclusively limited to companies that stay small. Consequently, highly consolidated sectors where the government is reliant on a small number of large businesses (which is especially a risk for the DoD) might be cut off from a potential source of new competitors, as graduation from small business status is a major obstacle for most firms because they cannot compete with competitors like the big 5 for government contracts without the support of policy.⁷⁶

7.3 Limitations of the Research

These results should be taken into consideration with the following limitations in mind. First, these results paint a purely descriptive picture of the success rates for small and non-small businesses contracting with the federal government. In other words, the calculation of the survival rates fails to control for other factors that could contribute to the success or failure of new entrants contracting with the federal government. Therefore, the reported results could be biased, where an outcome dependent on other factors may not be considered.

Second, and as previously discussed, the study team is suspicious of potential reporting errors that might be a contributing factor to the large drop off in new entrants towards the end of the study period. Relatedly, the study team found a case where a vendor making over six billion dollars and employing around 50 laborers in 2011 was classified as small because it operated in a NAICS sector that defines small as less than 100 employees. Thus, the study team is led to hypothesize whether the system used to classify what businesses are eligible for set-aside programs and report data for

⁷⁶ CSIS splits the industrial base into four categories. The Big 5 are the five largest defense contractors: Lockheed Martin, Boeing, Raytheon, Northrop Grumman, and General Dynamics.

analysis of these programs is failing to capture the population of truly small businesses. This finding is an indication that the data used in this paper could be misrepresenting small businesses in the federal contracting arena. The study team did not find any other warning signs in addition to the 2010 uni-modal distribution of contract obligations going to new entrants, thus, it is difficult to detect other incongruous classifications of business size. As previously discussed, defining small businesses is an imperfect science. This case involving Coins 'N Things, however, should encourage policy makers to reexamine the SBA's practices in defining small businesses because classifying businesses such as Coins 'N Things as small could create inefficiencies in executing and evaluating small-business set aside programs in practice.

Finally, the fact that the 2016 survival rates continue to drop past the 10-year survival rates indicates that 10 years is not a valid cut-off point for analyses studying this issue. Moreover, this indicates that there is no constant state for business survival rates, which implies that business cycles should be considered when conducting future analyses on this issue.

8. Conclusions

Federal acquisition can be a tough marketplace for businesses to enter, as ease of entry and sustainment in the market can be difficult. Factors including the highly regulatory environment, the concentrated industry for weapons system manufacturing, and the drawn-out federal budgetary processes define the market for federal contracts and make it hard for new vendors to enter, sustain themselves, and grow. The government recognizes that without intervention, the federal acquisition marketplace could suffer from inefficiencies such as high concentration and lack of innovative activity. Thus, government agencies and policy requirements exist to promote non-traditional vendors and small businesses in the federal contracting arena. Moreover, these agencies and policy requirements employ diverse mechanisms in their support for new entrants and small businesses. Small business programs are tailored depending on size, demographics of business owners, location, and innovative capacity. For instance, the HUBZone program focuses on promoting vendors located in historically disadvantaged areas, while the SBIR and STTR programs aim to bolster highly-innovative non-traditional vendors.

The results from this paper characterize the flux of new entrants in and out of the market for federal contracts from 2001-2016, and the study team compares these trends between small and non-small vendors. While there was an influx of new entrants in the federal contracting arena from 2001-2005, the number of new vendors contracting with the federal government, as well as with only the DoD, has decreased each year from 2006-2013. Since 2013, the number of vendors entering the federal arena has remained relatively low and constant. Furthermore, it was found that the 2016 survival rate for new vendors that had entered the market for federal contracts from 2001 to 2006 is about 20 percent. When considering uniquely small businesses, the graduation rates for small new entrants that survived 10 years are low at around 5-13 percent, depending on what year the vendor entered the market. For many of the survival rates calculated, a small new vendor's ability to survive is significantly different than that for a non-small new entrant. Moreover, small new vendors often have higher survival rates than their non-small competitors.

This finding departs from previous work on this issue where it had been found that large new entrants have higher survival rates than their small competitors. Due to the amount of small business set-aside programs implemented by the government, the market for federal contracts could actually favor small new entrants as opposed to their non-small competitors. Before congratulating the small business set-aside policies, however, it is important to consider the graduation rates. Only between 5-13 percent of small businesses that entered the market for federal contracts graduated from small business status. This signals that, while small business set-aside programs could be helping higher numbers of small-vendor new entrants survive in the federal contracting arena, they could also be incentivizing them to stay small. Policy makers should therefore reevaluate small business set-aside programs so that these programs are simultaneously helping small businesses survive and grow.

This paper shows ample potential for future work on the success of new entrants and small businesses in federal contracting. First, it will be important to continue tracking these trends so that policy makers can identify relationships between changes in set-aside programs and marketplace outcomes. Second, as acquisition changes in response to shifting strategic guidance, it will be important to maintain awareness of supply and demand in the federal contracting market. This awareness can help policymakers maximize efficiency for vendors participating in the market and help federal agencies looking to acquire innovative and affordable procurements. Third, future studies could aim to more concretely ascertain whether survival and graduation rates are impacted by policies or other firm-level, industry-level, and macroeconomic-level characteristics by specifically studying those causal relationships. Finally, it would be interesting to compare survival rates between different set-aside programs. While this paper focuses on the differences in survival rates between small and non-small new entrants, other set aside programs under the umbrella of small-business policies focus on additional socio-economic characteristics and geographic location, and whether survival rates for new entrants falling in these categories are different from new entrants not involved in such set aside programs is important for policy makers to understand.

Appendix: Approach to Export Vendor-Level Data from SAM

There are two methods for retrieving data from SAM: querying the database to return all vendor entries that match a single or set of specific search criteria or submitting individual 13-digit DUNS numbers, one at a time, to retrieve the corresponding vendor-level information. Although the study team executed both approaches, after cross-referencing the resulting data with data from FPDS, it was clear that these two approaches were unsuccessful in providing the data that is said to be available in SAM.

A.1 First Method

Execution of the first method, requiring querying the database to return all vendor entries that match a single set of specific search criteria, returns only partial vendor details. While there are many data fields available in SAM, this first query is limited in that it returns sixteen data fields. Of those fields, 'registration date' is not included, which is a variable describing the date that the initial entity registration was submitted. The study team had intended to use 'registration date' to define whether a firm is a new entrant.

To query the database using the first method, the user must choose a single or multiple search term(s). The user can use the following fields as search terms: Legal Business Name, the commercial and government entity (CAGE) code, DUNS number, Physical Address, City, Country, State, Zip Code, Registration Status, Expiration Date, DUNS+4 Number, Has Active Exclusion, Department of Defense Activity Address Code, and Delinquent Federal Debt Indicator. Using one of these fields to query the database, the user can glean all vendor entries that match the user-selected search term(s).

The study team chose to use a date-related search term because, since vendors must resubmit registration annually and have an 'expiration date' each time they resubmit a registration, a search by the field 'expiration date' between 1-1-2001 and 12-31-2018 should return all vendors that registered between 2000 and 2017 in addition to

the vendors that registered prior to 2001 but still have a contract that is active in the searched timeframe. In practice, however, this search returned roughly 41,000 unique DUNS numbers. Cross-referencing this with data from FPDS, it was apparent that the search did not successfully pull all vendors that registered within the timeframe. According to data in FPDS, there should be over 810,000 unique vendors that became active between 2000 and 2017.

When comparing the outputs of the two datasets, the study team found that, on average, two percent of the unique FPDS DUNS numbers contracting with the federal government between 2000 and 2017 matched the DUNS numbers retrieved from SAM. Table 7 shows the count of available unique FPDS DUNS numbers, the count of FPDS DUNS numbers that match to the SAM DUNS numbers retrieved using the first method, and the percentage of DUNS numbers in FPDS that match to DUNS numbers in SAM using the first method, by fiscal year. Since all vendors in FPDS that contract with a federal agency have to register with SAM prior to submitting a bid for a federal contract, the percentage of FPDS DUNS numbers matching to SAM DUNS numbers in each year should be 100 percent. It is clear from Table 7 that this is not the case, and thus the study team concluded that the first method was not returning an accurate representation of the available data.

Table 7: FPDS DUNS Numbers Matches to SAM									
<i>Fiscal Year</i>	2000	2001	2002	2003	2004	2005	2006	2007	2008
<i>FPDS Data</i>	39,986	25,346	29,564	39,665	55,097	62,115	48,744	42,391	39,766
<i>FPDS Matches to SAM</i>	986	602	742	937	1,304	1,492	1,089	895	730
<i>Percent of Matched Data</i>	2%	2%	3%	2%	2%	2%	2%	2%	2%
<i>Fiscal Year</i>	2009	2010	2011	2012	2013	2014	2015	2016	2017
<i>FPDS Data</i>	36,087	33,842	30,757	22,589	17,950	18,415	17,944	16,896	16,580
<i>FPDS Matches to SAM</i>	673	591	494	417	393	366	287	235	111
<i>Percent of Matched Data</i>	2%	2%	2%	2%	2%	2%	2%	1%	1%

Table 8 shows the count of SAM entries returned by the first method, the count of unique SAM DUNS numbers that match the DUNS numbers in the FPDS database, and the percent of SAM DUNS numbers that match to FPDS DUNS numbers in each fiscal year.

Table 8: SAM DUNS Numbers Matches to FPDS									
<i>Fiscal Year</i>	2000	2001	2002	2003	2004	2005	2006	2007	2008
<i>SAM Data</i>	2,009	4,198	5,452	2,267	3,398	2,320	2,285	1,817	1,616
<i>SAM Matches to FPDS</i>	441	1,802	2,827	976	1,685	1,190	980	809	666
<i>Percent of Matched Data</i>	22%	43%	52%	43%	50%	51%	43%	45%	41%
<i>Fiscal Year</i>	2009	2010	2011	2012	2013	2014	2015	2016	2017
<i>SAM Data</i>	2,196	1,912	1,494	1,275	1,812	1,724	1,840	1,487	1,018
<i>SAM Matches to FPDS</i>	620	541	340	320	296	243	192	133	56
<i>Percent of Matched Data</i>	28%	28%	23%	25%	16%	14%	10%	9%	6%

A.2 Second Method

The second method queries the SAM database by searching SAM using a list of previously identified DUNS numbers. The study team was able to collect a list of over 810,000 unique DUNS numbers from FPDS. This method is limiting, however, because although all FPDS DUNS numbers should be in SAM, because vendors are required to register in SAM before bidding for the contracts that are listed in FPDS, not all SAM DUNS numbers are in FPDS, because not all vendors wishing to contract with the federal government are able to do so. Figure 16 and demonstrate this relationship, with Figure 17 showing how the data should align and figure A-2 showing how the data aligns using the second method.

Figure 16: First Method

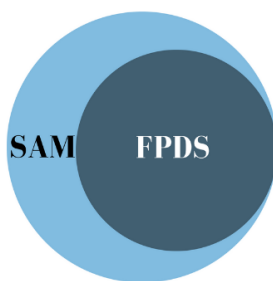
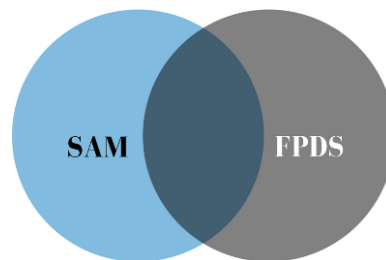


Figure 17: Second Method



With this limitation in mind, the study team queried the SAM database using the list of DUNS numbers it had from FPDS. Unfortunately, the study team found that this second search method also failed in providing an accurate representation of all vendors looking to contract with the federal government. After running a search using a random sample of 4,000 FPDS DUNS numbers, 36 percent returned errors, while the remaining 64 percent successfully returned vendor details. It is unclear why the 36 percent of missing DUNS numbers existing in FPDS were not found or why the numbers that did exist in SAM were not returned initially when using the first method. The study team did not explore further past the sample of 4,000 FPDS DUNS numbers, as the SAM database puts daily limits on queries, and running through all 810,000 unique DUNS numbers from FPDS would take an inordinate amount of time. Thus, due to better data quality and time constraints, the study team elected to use only FPDS data for the remainder of the study period. Acquiring all SAM data will be a subject of future study.



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