The Impact of Preference Programs in Public Procurement: Evidence from Veteran Set-Asides^{*}

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Abstract

Veteran-owned businesses are given preferential treatment in the allocation of procurement contracts from the U.S. Department of Veterans Affairs – currently the largest civilian federal agency in terms of procurement spending. We exploit a 2016 Supreme Court ruling that significantly increased the scope of these set-asides, to study the impacts of preference programs on both the targeted businesses and procurement outcomes. The policy change increased the share of contracts awarded to the target population, service-disabled veteran-owned small businesses, and benefited not only preexisting vendors but also new entrants, including those who had previously failed to win contracts. We find no evidence of spillovers to awards by other federal agencies, no decline in competition for awards, and no deterioration of contract execution performance by vendors. These findings suggest that VA set-asides have successfully improved outcomes for the target population without imposing significant costs on the government.

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1 Introduction

Public procurement is often used as a tool to achieve distributional goals. In the United States, federal procurement explicitly aims to assist and increase the participation of small businesses,¹ and establishes minimum shares of contracting dollars that should be awarded to specific types of small firms.² On top of these minimum requirements, individual agencies may develop additional programs to foster the participation of disadvantaged firms. The most prominent example is the Department of Veteran Affairs (VA)'s Veterans First program. Enacted in 2006, it states that contracts should be set aside for service-disabled veteran-owned small businesses (SDV), unless the contracting officer does not have "a reasonable expectation that two or more small business concerns owned and controlled by [service-disabled] veterans will submit offers and that the award can be made at a fair and reasonable price that offers best value to the United States."³ The VA is the largest civilian federal agency in terms of procurement dollars—spending over \$50 billion in FY2023—which makes this an important program with large stakes for both spending and SDV success.

In this paper, we study the effectiveness of procurement preference programs in improving outcomes for the targeted firms, as well as their impact on the agencies that implement them. We do so in the context of the VA's Veterans First program, using an exogenous expansion of the policy due to a Supreme Court ruling. In June 2016, the Supreme Court overturned two lower courts' rulings that had upheld a more restrictive application of the setaside requirements by the VA. Using data on the universe of federal procurement contracts,

¹ "It is the declared policy of the Congress that the Government should aid, counsel, assist, and protect, insofar as is possible, the interests of small-business concerns in order to preserve free competitive enterprise, to insure that a fair proportion of the total purchases and contracts or subcontracts for property and services for the Government [...] be placed with small-business enterprises, to insure that a fair proportion of the total sales of Government property be made to such enterprises, and to maintain and strengthen the overall economy of the Nation." (15 USC 361).

²This includes targets for any small businesses, small disadvantaged businesses, women-owned small businesses, and service-disabled veteran-owned small businesses. For the specific agency-level goals, see https://www.sba.gov/document/support-agency-contracting-goals.

³In practice, the exemption to this set-aside rule may apply often, since US Federal Procurement is characterized by relatively low levels of competition and a high share of single-bid awards (Kang and Miller, 2021; Carril, 2022; Carril et al., 2025).

we first show that, following the 2016 decision, contracts awarded to SDV firms increased starkly. Following the Supreme Court ruling, the share of procurement contracts awarded to SDVs increased by almost one-third, from 8% in 2014-15 to 22% in 2017-18. This increase was concentrated within Purchase Order awards, a category that includes smaller, non-specialized contracts often sourced from commercial vendors (such as IT services and medical supplies).

We use this policy expansion to estimate the effect of the program on the outcomes of targeted SDV firms. To estimate the impact on existing SDV vendors, we estimate a difference-in-differences event study comparing SDVs to non-veteran firms before and after 2016. After the 2016 policy expansion, existing SDVs were 10 percentage points more likely to win VA purchase order awards in any given year. Additionally, preexisting but unsuccessful SDVs – those registered in 2014 but with no observed awards – also benefited, although this magnitude is small compared to the treatment effects for existing SDVs. In dollar terms, we estimate the largest treatment effect for SDVs who regularly contract with the VA, as their total dollars awarded increased by 77 percent.

Next, we document a substantial increase in new SDV entrants resulting from the policy change, with the SDV share of new entrants tripling after 2016. Using cohort analyses, we estimate that relative to other new entrants, new SDV firms were younger in age after 2016, suggesting they were able to win their first VA award within a shorter timeframe after registration. However, we do not find evidence of improved survival, whether defined as continued registration in the SAM procurement database or continued success in winning federal procurement awards.

We also investigate the effect of the policy on federal procurement outcomes. We first test whether SDVs were also more likely to win awards from other federal agencies, but find no evidence of spillovers outside of the VA. This motivates an empirical strategy that uses non-VA agencies as a control group to estimate the impact of the policy on agency-level contract outcomes. In particular, we use synthetic control methods (Abadie and Gardeazabal, 2003; Abadie et al., 2010; Abadie, 2021) to measure the effect of the program on the intensity of competition and execution performance of VA contracts. Perhaps surprisingly, we find a large (though imprecise) *increase* in the number of bids received by VA contracts relative to a synthetic VA. This means that the increase in participation by new entrants and incumbent firms more than compensated for the negative effect of restricting competition to a narrower set of businesses. And while data limitations preclude us from measuring effects on award unit prices, we find no evidence that this expansion of awards to SDVs affected contract execution performance. Combining these findings with the positive impacts on targeted firms, our results suggest that the expansion of veteran set-asides for this relatively simple and standardized set of products generated substantial benefits for the targeted population, without any evidence of deteriorated outcomes for the government.

The existing literature analyzing the impact of preference programs has generally documented higher procurement costs that result from these policies. This may be due to the common context of highway procurement auctions (Marion (2007), Marion (2009), Krasnokutskaya and Seim (2011)), where significant barriers to entry exist. In the case of construction projects, Cappelletti and Giuffrida (2022) find that federal set-asides similar to our policy result in higher rates of participation but negative impacts on performance outcomes. For broader procurement contexts, however, studies have found more scope for cost-effectiveness (Nakabayashi (2013) and Corns and Schotter (1999)). Our paper provides a contribution by studying the procurement of goods and services supplied by commercial vendors, where we expect the lowest barriers to entry. We find that the expansion of set-asides increased awards to the targeted population without a decline in performance, suggesting that preference programs for disadvantaged businesses may be efficient if adopted for commercial procurement needs.

While most studies have focused on the impact of preference programs on procurement costs, few have studied the outcomes of the targeted population. Importantly, these effects may not be uniform across the target population. The existing evidence is mixed, with some studies finding improved outcomes for targeted firms (De Silva et al. (2012), Chatterji et al. (2014), Cappelletti et al. (2024)) while others do not (Myers Jr. and Chan (1996), Bates and Williams (1996), Cappelletti and Giuffrida (2022)). Rosa (2023) also shows that diversity targets can still lead to inequities if contractors can discriminate within the targeted population. We contribute to this literature by exploiting a large exogenous policy change to provide causal identification, and find that while the targeted population clearly benefited in terms of entry and increased awards, the largest gains accrued to the most experienced vendors. We also find no clear improvements in survival, a result that stands in contrast with previous evidence of significant and sustained positive effects on firms from initial receipts of government contracts [e.g., Ferraz et al. (2015); Lee (2022); Di Giovanni et al. (2022); Hjort et al. (2020)]. Apart from the different contexts, one factor explaining this divergence may be that target firms in our setting faced increased competition, precluding more significant and sustained gains.

The remainder of this paper is organized as follows. Section 2 provides background on how the VA's preference programs operate. Section 3 discusses our procurement data, and provides descriptive findings about the policy change. Section 4 presents our empirical analyses of the impacts on veteran-owned businesses, and Section 5 presents our empirical analyses of the impacts on federal procurement outcomes. Section 6 concludes.

2 Background

Preference programs in procurement take two main forms: bid subsidies and set-asides. Bid subsidies give certain vendors a competitive advantage in open auctions, while set-asides restrict participation to a given set of vendors. Since 1988, there have been government-wide procurement goals for awards to small businesses, with the current goal at 23% of dollars awarded. Within the umbrella of small businesses, there are additional procurement goals for several targeted categories. These include a 3% goal for awards to service-disabled veteranowned small businesses (SDVs), 5% to women-owned small businesses, 5% to small disadvantaged businesses (including minority-owned), and 3% to HUBZone businesses. These awards are primarily allocated through small business set-asides, and are often facilitated by the Small Business Administration.⁴

The VA is currently the largest federal agency outside of the Department of Defense in terms of federal procurement dollars. Its spending has risen steadily over the last decade, from less than \$20 billion in initial awards in FY2010 to almost \$50 billion by FY2022. In 2006, the creation of the Veterans First Contracting Program increased the preferences for veteran-owned small businesses for contracts originating from the VA. The agency follows a "rule of two" for procurement contracts, in which every contract must be set aside for service-disabled veteran-owned small businesses if there is a reasonable expectation that there would be at least two qualified businesses in that category. Within the hierarchy of VA set-asides, SDVs are given the topmost priority, followed by non-disabled veteran-owned businesses. Thus, in cases where two or more SDVs could be expected to bid, the set-aside would require the VA to accept bids only from SDV firms.

Prior to 2016, the VA interpreted that this "rule of two" did not apply to purchases through Federal Supply Schedules (FSS), which are long-term contracts awarded by the General Services Administration (GSA), and that the VA (and all agencies) use to order commercial supplies and services at pre-determined prices. This allowed the VA to routinely order goods and services online under pre-negotiated prices, without having to solicit new contracts. We exploit the *Kingdomware v. United States* Supreme Court ruling on June 16, 2016, which prevented the VA from circumventing the "rule of two" by ordering directly from FSS vendors, causing the requirement to apply to *all* VA procurement actions. This should lead to a subsequent rise in the SDV share of regular award contracts for the goods and services that were previously ordered through FSS vendors.

 $^{^4}$ Small business designation is based on employment or revenue thresholds, and varies by industry. With the modal employment threshold at 500 employees and the majority of revenue thresholds above \$10 million, all but the largest firms would qualify as small businesses.

The primary way contracting officers determine whether qualified businesses exist is through the pre-certification of vendors as SDVs, which is required for them to bid on these set-asides. In addition to meeting revenue thresholds to be considered a small business, becoming certified as an SDV requires at least fifty-one percent controlling ownership by a service-disabled veteran. This requirement is likely to severely limit the ability of existing non-veteran-owned firms to pass themselves off as an SDV.

Service-disabled veterans are those receiving compensation from the VA for a serviceconnected disability. The VA's Disability Compensation program awards monthly benefits to veterans with one or more service-connected disabilities, and now compensates almost 30% of the veteran population.⁵ It is important to note that there is no means-testing, and disability recipients are not restricted to the elderly. In FY2022, the most common age range of new recipients was between 20 and 30 years of age, and over 40 percent of all recipients are under the age of 55.⁶ Thus, many service-disabled veterans are early in their working lives, and may benefit from the opportunity to start their own small businesses. Coile et al. (2021) finds that increases in disability benefit receipt lowered rates of overall employment, but increased the probability of self-employment among near-elderly veterans.

3 Data

Our primary data source is the Federal Procurement Data System (FPDS), which consists of the universe of contracts awarded by the Federal Government from October 2008 through June 2023, and is accessible through usaspending.gov. We focus on the initial action that obligates funding to each contract to identify the award date. In addition to the dollar amount obligated for each contract, we observe the funding agency, product category,

⁵The amount of compensation is determined based on the number and severity of service-connected disabilities, with veterans receiving a combined disability rating that ranges from 10% (\$166/month in benefits) to 100% (\$3757/month in benefits). The most common disabilities are ringing in the ears, limited knee movement, hearing loss, PTSD, and lower back pain or neck pain.

⁶VBA Annual Benefits Report, FY2022 https://www.benefits.va.gov/REPORTS/abr/docs/ 2022-compensation.pdf

and any preferred statuses of the selected firm, such as veteran-owned businesses.

A secondary source of data is the System of Award Management (SAM.gov). SAM provides the list of registered firms that are allowed to compete for and receive government contracts, even if they have not won awards. Firms are required to renew their registration every year, and they can be excluded from SAM if there is evidence of "a lack of business honesty or integrity (...) based upon regulation, statute, executive order or other legal authority". We obtain two snapshots of SAM per year from 2014 to 2023, and use this to create a panel of registered firms. This allows us to infer entry and exit from the federal procurement market by individual firms, which are identified by either their CAGE or UEI number.

Because SAM does not include information about veteran-owned statuses, we further supplement these data with Veteran Certification Applications submitted to the Vets First Verification Program from January 2014 to April 2021. This verification program is an important first step SDVs must take, as it provides the verification needed to qualify for set-asides. Approximately 23,000 unique businesses applied and were approved over this period, although the actual number that went on to win contracts is significantly lower. We match veteran certifications to SAM registrants using firm name and address, and are able to match approximately 85 percent of veteran certifications.

3.1 Descriptive Statistics

Appendix Figure A.1 plots the distribution of VA award values for SDV and non-veteran businesses prior to the policy change, from 2011 to 2014. The four categories of award types are BPA calls, definitive contracts, delivery orders, and purchase orders.⁷ Delivery orders are the most common, and are the method through which FSS orders are placed. Purchase orders—used for one-off purchases under simplified acquisition procedures—are

⁷BPA calls are orders from an authorized Blanket Purchase Agreement, which is a specific type of indefinite delivery vehicle (IDV) used by civilian agencies. All other IDV orders are classified as delivery orders. Contracts that are directly awarded to vendors (and not purchased through an IDV) are classified as purchase orders if they are awarded using simplified acquisition procedures (a streamlined purchase process for awards that fall below a dollar threshold), and as definitive contracts otherwise.

the second most common award type, and delivery and purchase orders together account for over 90 percent of awards. Due to the pre-existing preferential treatment of service-disabled veterans, average contract values were already higher for SDVs than for non-veterans; awards especially favored SDVs in the Construction and Maintenance product categories. Among delivery orders and purchase orders, the large majority of awards are less than \$1 million in value, which is represented by the dashed vertical line. To reduce the influence of outliers, we winsorize contracts greater than \$1 million in our analyses.

Table 1 reports summary statistics for this same sample. From 2011 to 2014, servicedisabled veterans received the largest preference in the awarding of Definitive Contracts, which include long-term contracting arrangements and large purchases that exceed simplified acquisition thresholds. 38% of these awards went to SDVs, versus the 6-8% share in the other three award categories. But even within the subset of Purchase Orders, our award category of interest, SDVs received larger awards on average: the mean contract value for SDVs was \$32,770 versus \$18,680 for non-veterans. While the majority of VA procurement is for medical products, these orders make up a smaller share of SDV awards. Meanwhile, less specialized services, such as maintenance/repair, are awarded to service-disabled veterans at higher rates than non-veterans. Appendix Figure A.2 breaks down the SDV-share of the largest categories of VA purchase order awards, and shows that after the policy change, the share of awards going to SDVs rose the most in the medical products category. Meanwhile, medical services – a category likely to have the highest barriers to entry – were mostly awarded to non-veteran firms, and this continued to be the case even after the policy change.

3.2 2016 Policy Change

The June 2016 Supreme Court ruling, which prohibited procurement officers from using federal supply schedules as a workaround to the "rule of two", could be predicted to affect certain award types more than others. Purchase orders, which can be viewed as the closest substitute to ordering through an FSS, should receive a boost in SDV awards if there was previously substantial scope for procurement officers to circumvent the "rule of two". Within this award category, the raw FPDS contract data exhibits a clear rise in the share of contracts awarded to SDV vendors starting in the second half of 2016. The left panel of Figure 1 shows an immediate increase in the share of purchase order contracts awarded to SDVs, from a prepolicy average of 6.3% to over 25% one year after the policy change. The right panel shows an even starker increase as a share of dollars awarded. Meanwhile, panel A of Appendix Figure A.3 shows only modest increases among the three other award categories. In dollar terms, SDV businesses went from receiving an average of \$127 million in purchase orders per fiscal year pre-2016, to an average of \$665 million per fiscal year in 2017-2019, a fivefold increase (Figure A.4).

This significant growth in purchase orders indicates that the Supreme Court ruling clearly had an impact in this dimension of contracting, although it is unclear whether the original motivation for using the loophole was due to lower acquisition costs or a more simplified procedure. Furthermore, panel B of Appendix Figure A.3 shows that this pattern is not present for awards from other federal agencies besides the VA, which were unaffected by the ruling. To check for manipulation of SDV status, Appendix Figure A.5 graphs the number of vendors (identified by their UEI number) that were observed switching to SDV status among vendors that initially appear as non-SDV. Although there is a small bump in the year immediately following the policy change, the overall number of businesses that switch is extremely low. Going forward, our analyses will focus on purchase orders, as we utilize the expansion of SDV awards driven by the 2016 policy change to identify the impacts of greater preferences on outcomes for both SDVs and the Federal Government.

4 Impacts on Veteran-Owned Businesses

The previous section documents a significant increase in awards to SDV businesses after the 2016 policy change. We now quantify this treatment effect separately for the two groups of firms that may have benefited from this reform: existing SDV firms and new SDV entrants.

4.1 Existing Businesses

We first estimate the impact on existing SDVs using a difference-in-differences design. We compare (subgroups of) SDV firms to non-SDV vendors, before and after the policy change. To ensure comparability to SDVs, we restrict the non-SDV control group to firms with small business designations. We estimate a series of specifications of the form:

$$Award_{it} = \alpha_t + \gamma_i + \sum_{t \neq 2016} \beta_t \cdot SDV_i + \epsilon_{it} \tag{1}$$

where an observation is a firm (i) by year (t), where t is defined as the one-year period starting from July of t - 1 to June of t. Award_{it} is an indicator for whether the vendor won a purchase order award from the VA, and SDV_i is an indicator for whether the firm is an SDV. Our coefficients of interest are β_t , which correspond to the difference in award probabilities between SDV and non-SDV firms, relative to the omitted period of 2016.⁸ Our analysis sample includes all VA purchase order awards between July 2012 and June 2023, although we use the full FPDS database starting from 2008 to identify existing businesses.

We first estimate the above specification on a sample of existing firms that previously won a VA purchase order award of at least \$5k, between July 2009 and June 2012.⁹ Like in any standard difference-in-difference setting, our main identification assumption is the existence of parallel trends. This implies that, in the absence of a Supreme Court ruling, outcomes for SDVs would have evolved in parallel trends relative to non-SDVs. While this assumption is not directly verifiable, our event study estimates will allow us to assess whether there was evidence of a pre-trend in the period from 2013 to 2016. Additionally, because

⁸Since the Supreme Court ruling occurred in June 2016, we consider t = 2017 (which starts on July 1st, 2016) as the first post-treatment period.

 $^{^{9}}$ Restricting to awards of 5k or more excludes 9% of pre-existing firms; robustness to this exclusion is reported in Appendix Table A.1

the policy change required procurement officers to shift orders from federal supply schedules to purchase order awards (i.e., the total amount of purchase orders increased), it is unlikely the policy resulted in negative spillovers for non-veteran firms.

Figure 2 plots the estimates of β_t from Equation 1 for the full sample of existing firms. We observe no pre-trend prior to 2016, and a statistically significant and sustained increase in the probability of winning an award for SDV businesses. After the 2016 policy change, existing SDVs were 9 to 12 percentage points more likely to win a VA contract in any given year. In the first year after the policy, an increase of 12.4 percentage points equates to a 27 percent increase in the probability of winning, relative to the pre-2016 mean of 46 percent. To compare the treatment effect for SDVs relative to other disadvantaged small businesses, Figure 3a plots the estimates of a specification that not only includes SDV interactions, but also interactions for being a non-SDV veteran-owned business, and for being a woman- or minority-owned business. The omitted category in this case is other small businesses that do not fall into any of the previous groups. In contrast to SDVs, the other two categories of firms experienced no statistically significant difference in awards after the policy change.

To test for heterogeneous treatment effects for firms with varying degrees of procurement "experience", we next estimate Equation 1 on four mutually exclusive subgroups. We divide our sample of existing firms into three subgroups: (i) *regular winners* defined as firms who won an award every year from 2010 to 2012, and whose awards totaled \$100k or more; (ii) *recent entrants* defined as firms who won their first VA award in 2011 or 2012; and (iii) *sporadic winners* defined as all the remaining firms with some award in our sample. We then identify a fourth subgroup of *previously unsuccessful* firms; that is, businesses who had entered the federal procurement market by 2014 but had yet to successfully win an award from any agency.¹⁰ This is a policy-relevant group of interest, as it is not clear whether the policy change would allow these existing but previously unsuccessful vendors to finally win

a contract.

¹⁰Due to data limitations, the earliest year we have registration data for firms is 2014. Thus, we restrict the analysis for this subgroup to the 2015-2023 period.

Figure 3b plots event study estimates from four separate regressions of each experience group. We observe a statistically significant and sustained increase in the probability of winning an award for every single subgroup of SDVs. However, the treatment effect for previously unsuccessful SDVs is approximately one-fifth of the estimates for the other three groups. After the 2016 policy change, previously unsuccessful SDVs were only 1.5 to 2.7 percentage points more likely to win a VA purchase order award in any given year. Meanwhile, the other three groups of existing winners all experienced treatment effects of roughly 10 percentage points.

Pooled difference-in-differences estimates for each subgroup are reported in Table 2. We report estimates for Post * SDV, which interacts SDV status with an indicator for 2017 and later. Panel A shows that among the subgroups of firm experience, recent entrants experienced the largest treatment effect of 14.7 percentage points. Regular and sporadic winners each experienced an average treatment effect of 10.2 and 9.9 percentage points, while previously unsuccessful SDVs only increased their likelihood of winning by 2.2 percentage points. Relative to the 2015 means for SDV firms, these magnitudes equate to a 22%, 41%, and 34%, for regular winners, recent entrants, and sporadic winners, respectively. Although previously unsuccessful SDVs benefit the least in absolute terms, they experienced the largest percentage increase (over 150 percent). Panel B then estimates the impact on total award value, conditional on having won an award. We estimate a statistically significant increase in award values for all subgroups except sporadic winners. Among the existing winners, it is the subgroup of regular winners who experience the largest increase in total dollars awarded (77%).

Finally, we estimate whether the 2016 policy change impacted survival in the federal procurement market. We define survival as an indicator for whether the firm wins another award from any federal agency up until the end of our sample period in 2023. Figure 4 plots the estimates of β_t from a specification that includes time effects interacted with SDV, non-SDV veteran-owned business, and woman- or minority-owned business dummies. While

the pooled difference-in-differences estimate does not imply a statistically significant change in the likelihood of survival for SDV firms, we see that SDVs went from being less likely to survive relative to veteran-owned and woman or minority-owned firms to more likely to survive after 2016.

4.2 New Entrants

In this section, we investigate the effects of the policy on new entrants. We define a new entrant in cohort s as a business whose first VA award was a purchase order won during a given year.¹¹ Note that this definition implies that a new entrant is new to the VA, not necessarily new to the federal procurement market, and that new entrants need not be young in establishment age.

It is visually apparent from the raw data that the policy change generated substantial new entry and thus benefited new entrants in addition to incumbent firms. This is seen in Figure 5a, which plots the share of VA awards allocated to new SDV vendors, relative to new woman/minority-owned firms and new non-SDV veterans. There is a discontinuous jump in awards to new SDVs after June 2016, more than doubling the share of awards received by this group. Furthermore, Figure 5b shows that until the middle of 2016, new SDV vendors made up around 8% of new entrants annually. After the policy change, the share of new businesses designated as an SDV jumped threefold to 25%.

More formally, we conduct a cohort analysis to compare new SDV entrants to other disadvantaged entrants before and after the policy change. For each cohort of new entrants (over the one-year period s from July to June), we estimate regressions of the following form,

¹¹By first VA award we mean first observable VA award since the start of our FPDS data in January 2008.

which include only one observation per firm:

$$Outcome_{i} = \alpha_{s(i)} + \sum_{s(i)\neq 2016} \beta_{s(i)} \cdot SDV_{i} + \sum_{s(i)\neq 2016} \gamma_{s(i)} \cdot Veteran_{i} + \sum_{s(i)\neq 2016} \mu_{s(i)} \cdot Woman/Minority_{i} + \epsilon_{i}$$

$$(2)$$

where *i* indexes firm, s(i) indexes the cohort of firm *i*, SDV_i is an indicator for whether the firm is an SDV, $Veteran_i$ is an indicator for whether the firm is non-SDV veteran-owned, and $Woman/Minority_i$ is an indicator for whether the firm is woman or minority-owned. Our coefficients of interest are β_s , which correspond to the difference in outcomes between SDV and other small entrants in cohort *s*. To benchmark these results, we compare these coefficient estimates to γ_s and μ_s , the corresponding estimates for veteran and woman- or minority-owned businesses.

Our primary outcome of interest is the age at first award, where age is measured by the number of months since the initial registration date in SAM (i.e., entering the procurement market). We restrict to firms that are ever registered in SAM, which requires us to begin our sample in 2014.¹² Prior to 2017, the mean age at first award was 53 months for SDVs, 71 months for woman/minority-owned businesses, and 71 months for the rest.

Figure 6 plots the estimated coefficients on SDV status in Panel A, and a comparison with other disadvantaged firms in Panel B. Immediately after the policy change, new SDVs won their first VA award 11-14 months faster than non-veteran owned new entrants. The decline in the age at first award remains relatively stable post-2016, whereas Panel B shows that other disadvantaged firms experienced no decline in their age at first award. Pooled treatment effects, estimated using a difference-in-differences design, are presented in Table 3. We estimate an average decline of 14 months for SDV firms in Column 1.

We also use information on the year each business was established to estimate the firm's

¹²Although our SAM database begins in 2014, initial registration dates extend as far back as 1997. Within our matched sample, fewer than 0.8% of firms won their first award before their recorded initial registration date, so we do not believe there is much scope for measurement error.

actual age. We construct an indicator for young firms less than 3 years of age and repeat the pooled difference-in-difference estimation. Column 2 of Table 3 shows that post-2016, new SDV entrants were also 7.2 percentage points more likely to be a young firm. Thus, not only were awards to new SDV entrants increased after the policy change, but new entrants were also able to win their first award within a shorter time frame than before. In Columns 3 and 4, we compare these results to estimates of new entrants to non-VA agencies as a placebo test. Although we still estimate a small decline in age for new SDV entrants post-policy change, the decline is also present for woman/minority-owned firms who were untreated. This points to an overall trend of new disadvantaged firms gaining access to procurement awards, so our estimates in Columns 1-2 are likely an overestimate of the policy's true impact on firm age at entry. Still, the magnitudes suggest that the policy had a significant causal effect on firm age above and beyond this underlying trend.

Turning to measures of survival in the federal procurement market, in Table 4 we find no evidence of a change in the likelihood for firms to remain registered in SAM, whether the outcome is the length of registration in SAM (Column 1) or the presence of any gaps in registration (Column 2). This could be because despite the policy's expansion of set-asides for SDVs, the subsequent increase in new SDV entrants actually *increased* competition for VA awards. Another potential explanation for the absence of a treatment effect could be because the new entrants pre-2016 will also be "treated" if they continue to stay in the procurement market after 2016, creating leakage across our treatment and control cohorts.

To explore this, we create a measure of 5-year survival, defined as whether the new entrant wins another federal award 5 years or later. Figure 7 plots estimates of SDV status interacted with each entry cohort. Cohorts entering 2011 and earlier are fully untreated, since 5-year survival is measured before the policy change. In contrast, new entrants in 2012-2016 are partially treated within this 5-year window, and so we might predict increases in survival as early as 2012. There appears to be some evidence of this, as the estimated coefficients on SDV begin to increase after 2011. However, benchmarked against other disadvantaged new entrants in Panel B, the impact on survival is less obvious.¹³ Altogether, we take this as evidence that while the policy change led to a significant increase in new SDV entrants, it did not lead to lasting impacts on survival after entry.

5 Impacts on Federal Procurement

Having documented the impact of the expanded use of preferences in VA awards on both incumbent and new-entrant SDVs, we now study the extent to which the policy affected the Federal Government. Our identification strategy will rely on comparing VA awards to those from other agencies that did not change their policy regarding preference programs. The underlying assumption is that outcomes at non-VA agencies would have continued to evolve in parallel to those at the VA in the absence of the Supreme Court ruling. This assumption would not hold, however, if the policy change at the VA had spillovers to other agencies, violating the so-called Stable Unit Treatment Value Assumption (SUTVA). For example, this could occur if SDVs who benefited from the expansion in preference at the VA go on to win more contracts at other agencies.

We, therefore, proceed in two steps. First, we test whether the ruling expanding VA policy also increased SDV's success in winning awards from other federal agencies. After finding no evidence of such spillovers, we then estimate the effects of the policy on two sets of contract outcomes—the extent of competition for awards and contract execution performance—using non-VA agencies as the basis for constructing a control group using synthetic control methods (Abadie and Gardeazabal, 2003; Abadie et al., 2010).

5.1 Spillovers to non-VA Agencies

We estimate whether the increase in set-asides from the VA also led to spillovers to other federal agencies. We identify businesses that were awarded their first federal contract from

 $^{^{13}\}mathrm{The}$ same pattern holds when estimating 3-year survival in Figure A.6.

the VA, and estimate the likelihood of winning a contract from any other federal agency within the next three years. We estimate a difference-in-differences specification to test whether SDV businesses experienced a change in their non-VA awards after the 2016 policy change, relative to their non-veteran counterparts. We estimate the following regression specification at the firm-year level from 2010 to 2023 (resulting in up to 4 observations per firm).

$$nonVAawards_{it} = \alpha_t + \beta * (t > 2016) * SDV_i + \gamma * SDV_i + Entrycohort_i + X'_i \delta + \epsilon_{it} \quad (3)$$

where *i* indexes firm and *t* indexes year. As outcome measures of success with non-VA agencies in the three years following their initial VA award, we consider an indicator for any non-VA award, the log of the number of awards, and the log of dollars awarded. After controlling for entry-cohort and year fixed effects, β is our difference-in-differences coefficient of interest. To control for firm characteristics, X'_i includes the log contract value of the initial award, the month of initial award, major product group fixed effects, and 2-digit NAICS fixed effects.

Table 5 reports the regression estimates. At baseline, new SDV vendors are 8 percentage points more likely than other new vendors to win contracts from other agencies after being awarded a VA contract. However, the Post*SDV interaction is close to zero and not statistically significant, indicating no change in the likelihood of spillovers for SDVs after the policy change. The same is true for our intensive margin measures.

5.2 Competition and Performance

While we provide evidence that the policy indeed benefited the target population, an open question is how it affected contract outcomes for the Federal Government. We focus on two sets of outcomes: the extent of competition for awards and contract execution performance.¹⁴

The effects on these two margins are *ex ante* ambiguous. The mechanical effect of set-asides is to decrease competition, as a smaller set of firms is qualified to bid. However, the restriction may induce more firms to enter in equilibrium, and this entry effect may moderate or even more than compensate for the competition effect (Li and Zheng, 2009; Krasnokutskaya and Seim, 2011). Indeed, the entry effects we documented in the previous section already suggest that this mechanism may be quantitatively relevant. The impact on execution performance measures, such as cost overruns or delays, is similarly uncertain. First, restricting the set of participants from the same set of potential bidders may lead to different effects on performance depending on the underlying product characteristics (Carril et al., 2025). Second, the entry of new participants with potentially different execution capabilities further complicates a precise prediction on execution performance.

5.2.1 Methodology

We build on our results showing the absence of spillovers by using agencies other than the VA to build counterfactual procurement outcomes. First, focusing exclusively on purchase orders, we aggregate our contract data to the agency-by-half-year level and use the synthetic control method. We use the implementation by Arkhangelsky et al. (2021), which we briefly characterize below. For details, see Abadie and Gardeazabal (2003); Abadie et al. (2010); Abadie (2021).

Let j = 1, ..., J, denote federal agencies, where j = 1 corresponds to the VA. We observe outcomes Y_{jt} , where t denotes a half-year. The method searches for weights ω_j to construct the counterfactual VA outcome $\hat{Y}_{1t}^C = \sum_{j \neq 1} \omega_j \cdot Y_{jt}$, such that the counterfactual most closely resembles VA's pre-treatment values. These weights are nonnegative and sum up to one, and are such that they minimize a distance metric between Y_{1t} and \hat{Y}_{1t}^C , for $t \leq 2016$. The

¹⁴Of course, another key relevant outcome is award price. However, we are unable to assess the impact on unit prices, since the Federal Procurement Data System (FPDS) does not report prices and quantities separately, only total award value. This limitation is shared with the procurement literature based on FPDS.

estimated treatment effect for a given period t > 2016 is simply the difference between the VA outcome and the counterfactual outcome, i.e., $\hat{\tau}_t = Y_{1t} - \hat{Y}_{1t}^C$, for t > 2016. A single average treatment on the treated (ATT) effect can be obtained as the average effect across t > 2016. Standard errors are obtained using a permutation method which sequentially reassigns the treatment to agencies in the control pool and estimates a distribution of "placebo effects".

Before estimating the effects on our outcomes of interest, we first verify that the policy indeed led to an increase in SDV set-asides and awards relative to non-VA agencies. As expected, Figure 8 shows that the VA saw a large increase in the use of SDV set-asides and the actual award to SDV firms, whereas the synthetic VA continues on a flat trend. Table 6 shows the estimated ATTs and implies that the policy led to a 12.77 percentage point increase in the use of SDV set-asides (column 1), and a 23.31 percentage point increase in the share of awards to SDV businesses (column 2). These estimates are highly significant and very large in magnitude, considering the low baselines (1.6% and 6.3%, respectively).

Appendix Table A.2 presents weights for the selected agencies in the control group for each specification we estimate. This shows, for instance, that the effect on SDV set-asides relies on a synthetic control formed by the Department of Housing and Urban Development (59%), the National Science Foundation (18%), the Securities and Exchange Commission (17%), and the International Trade Commission (6%).

5.2.2 Extent of Competition

To measure the extent of competition for awards, we use the number of offers received in the solicitation of the procurement contract. Given how skewed this variable is – the majority of purchase orders only received a single offer – we also construct a dummy variable that takes the value of one if more than a single offer is received.

Figure 9 presents trends in the extent of competition for the VA and the synthetic VA. Panel A shows the average number of offers received, while Panel B shows the share of contracts that received multiple offers. In both cases, we see an apparent increase in the

extent of competition for VA awards relative to the synthetic control. The point estimates for the ATT are substantial: column 3 in Table 6 shows that the policy led to 0.18 additional offers and an increase of 5.63 percentage points in the share of awards receiving multiple offers. These point estimates represent increases of 13% and 34% relative to the pre-policy mean for the VA. However, the coefficients are imprecise, and we are unable to reject null effects. At the very least, they suggest that SDV set-asides do not diminish competition, highlighting the role of entry and increased participation of targeted firms.

5.2.3 Contract Execution Performance

Finally, we investigate whether the extended use of preferences for SDV businesses resulted in changes in contract execution performance. We focus on two measures of performance, namely delays beyond the expected duration of the contract, and cost overruns above the base contract value.¹⁵

Figure 10 shows trends in delays and cost overruns for the VA and synthetic controls. Panel A plots the share of awards with delays within the scope of the original agreement, and Panel B plots the average cost overruns as a share of the initial budget. In both cases, there is no significant divergence in the trends between the two groups following the 2016 Supreme Court ruling. The estimated ATTs are very small and statistically insignificant: Table 6 column 5 shows that the share of delayed contracts increases by one-hundredth of a percentage point, while column 6 implies that average cost overruns as a share of the initial budget *decrease* by 1.6 percentage points.

¹⁵These measures are commonly used in the public procurement literature (e.g. Decarolis, 2014; Kang and Miller, 2021; Carril, 2022; Carril et al., 2025), and they capture the extent of costly adaptation Bajari et al. (2014). Furthermore, using data from the *IT Dashboard*—a sample of large IT contracts for which quality is systematically measured—Carril (2022) shows that delays and overruns are positively correlated with more general contract quality assessments based on objective product and service characteristics.

5.2.4 Robustness checks

We finalize this section by conducting a series of robustness checks on our preferred specification. First, we show that the absence of evidence of a detrimental impact on performance is robust across various measures, including alternative methods of computing delays and overruns, as well as contract termination (see Appendix Table A.3). Second, we verify that all of our synthetic control estimates are robust to the inclusion of additional covariates in the creation of the synthetic VA, such as each agency's set-aside share and log(mean contract value) (see Appendix Figure A.7 and Table A.4). Finally, we test the sensitivity of our results to using a common set of weights to construct our synthetic VA, and these results are graphed in Appendix Figure A.8. Using the optimal weights assigned for the SDV share specification and holding these weights fixed for our other outcomes of interest still produces qualitatively similar results: relative to the synthetic control, VA awards become more competitive after the policy change, and do not experience a change in execution performance.

5.3 Discussion

Overall, our results are inconsistent with the notion that increased access to federal procurement contracts by SDVs came at the cost of sacrificing competition or deteriorating execution performance for the VA. Although imprecise, our estimates on competition may actually suggest the opposite: new entry may have compensated for the mechanical effects of preference restrictions, leading to a larger number of offers received.

One important caveat to our results is our inability to observe award prices. This is an unfortunate feature of the data available for federal awards (FPDS). It is possible that SDV set-asides may lead to increased procurement costs, which could complicate the evaluation of the policy. Indeed, other preference programs such as bid subsidies have been shown to increase procurement costs (Marion, 2007, 2009; Krasnokutskaya and Seim, 2011).

Another relevant aspect to note is the scope of the policy expansion, which affected

the procurement of commercially available goods and services that could have previously been purchased through an FSS. This implies that the affected contracts primarily involve standardized goods and services. Evidence from the DOD suggests that for these relatively simple contracts, more competition is likely to translate to lower prices at the award stage, with little effect on post-award performance (Carril et al., 2025). On the other hand, it means that we may not observe the same type of null effects on performance if the policy is applied to more complex contracts. Relative to larger, more specialized acquisitions, purchase orders may, therefore, be a more efficient sphere through which governments can increase preferences for disadvantaged businesses.

6 Conclusion

The Department of Veterans Affairs awards a large and growing share of civilian federal procurement contracts (over \$30 billion annually since FY2020). However, the distribution of procurement awards is highly skewed; among both the VA and non-VA agencies, the majority of purchase order awards went to only the top 2 percent of vendors prior to 2016. While preference programs such as the VA's set-asides for service-disabled veteran business owners are intended to level the playing field for disadvantaged firms, whether this fosters new entrepreneurship or simply increases awards to existing qualified vendors is of great policy relevance.

We evaluate the effectiveness of the VA's SDV preference program in improving the outcomes of targeted businesses and find that the 2016 expansion in scope did, in fact, increase awards to vendors not previously contracting with the government. This included not only new businesses but also those that had previously been unsuccessful in winning awards.

On the other hand, we find no negative impacts on the Federal Government: competition for awards did not decrease—and may have even increased given greater entry—while contract execution performance remained unchanged. These findings suggest the VA's use of SDV set-asides for commercially available products and relatively low-value contracts has been successful in improving outcomes for the target population, without imposing significant efficiency costs for the government. While purchase orders awarded by non-VA agencies became increasingly concentrated within the top vendors after 2016, concentration actually reversed for VA awards.

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FPDS initial action purchase order contracts funded by VA. Measures calculated for half-year intervals. Awards larger than \$1 million, which account for the top 1 percent, are winsorized.





(N = 125,257) Includes a balanced panel of 1,263 SDV businesses and 10,124 non-SDV small businesses that had been awarded a VA contract between July 2009 and June 2012. Sample excludes non-disabled veteranowned businesses, and businesses that received less than \$5000 in awards. Observations at the firm-year level, and outcome is an indicator variable equal to one if firm won a purchase order award during the period (from July of the previous year to June of the current year). Regression estimates of the SDV*time interaction are plotted with 95% confidence intervals, and standard errors clustered at the firm level. Controls include time FEs and firm FEs.

Figure 3: Heterogeneity in award probability - Existing Businesses (2013 - 2023)



(a) By target group

Panel (a) plots estimates from a single balanced panel regression (N = 137,995). Sample includes 1263 SDVs, 1158 non-disabled veteran-owned businesses, and 2314 woman or minority-owned businesses. Panel (b) plots estimates from four separate regressions of balanced samples excluding non-disabled veteran-owned businesses (N = 38896, 29722, 56639, 336132 respectively). Observations at the firm-year level, and outcome is an indicator variable equal to one if firm has survived in the FPDS data until 2023. Regression estimates of the SDV*time interaction are plotted with 95% confidence intervals, and standard errors clustered at the firm level. Controls include time FEs and firm FEs.



Figure 4: Survival - Existing businesses (2013 - 2023)

(N = 137, 995) Plots estimates from a single balanced panel regression. Observations at the firm-year level, and outcome is an indicator variable equal to one if firm won a purchase order award during the period (from July of the previous year to June of the current year). Regression estimates of the SDV*time interaction are plotted with 95% confidence intervals, and standard errors clustered at the firm level. Controls include time FEs and firm FEs.



Figure 5: Awards to New Entrants (2010 - 2023)



(a) As a share of VA awards

(b) As a share of new VA entrants



FPDS purchase order awards funded by VA. A firm is defined as new the first month they win a VA procurement award.





A. Time interactions with SDV status

(N = 8,731) Each panel plots coefficient estimates from a pooled regression at the firm level. Outcome is measured as the number of months since initial SAM registration, and the mean across all cohorts is equal to 74 months (mean for SDV is 52, mean for non-disabled veteran is 91, and mean for woman/minority is 77). Controls include indicators for SDV, veteran, and woman/minority, and entry year FEs. Estimates are plotted with 95% confidence intervals using robust standard errors.





(N = 52,315) Each panel plots coefficient estimates from a pooled regression at the firm level. Outcome is measured as an indicator for whether the firm wins a federal award 5 years or more after entry. Controls include indicators for SDV, veteran, and woman/minority, and entry year FEs. Estimates are plotted with 95% confidence intervals using robust standard errors.



A. Use of Sevice-Disabled Veteran-Owned Set-Asides

B. Awards to Sevice-Disabled Veteran-Owned Businesses



This figure shows trends in two outcome variables for the VA and a control group constructed using the synthetic control method. An observation is an agency by half-year. Panel A shows the share of awards that are set aside for SDV businesses. Panel B shows the share of contracts awarded to SDV businesses. The sample is restricted to purchase orders in the years 2010 through first half of 2023. The synthetic VA is generated from a pool of 47 federal agencies. The full list of agencies and their weight in the synthetic control specifications is presented in Appendix Table A.2.







This figure shows trends in two outcome variables for the VA and a control group constructed using the synthetic control method. An observation is an agency by half-year. Panel A shows the average number of offers received. Panel B shows the share of awards where more than a single offer was received. The sample is restricted to purchase orders in the years 2010 through first half of 2023. The synthetic VA is generated from a pool of 47 federal agencies. The full list of agencies and their weight in the synthetic control specifications is presented in Appendix Table A.2.





A. Share of awards with within-scope delays (duration exceeding expected)

B. Average within-scope cost overruns (spending exceeding initial budget, in relative terms)



This figure shows trends in two outcome variables for the VA and a control group constructed using the synthetic control method. An observation is an agency by half-year. Panel A shows the share of contracts that experienced a delay, defined as modifications within the scope of the original contract resulting in an actual duration that is longer than originally expected. Panel B shows average cost overruns, defined as the difference between actual spending and originally expected spending, as a share of the initial budget. Like with delays, cost overruns are only considered if they arise due to modifications within the scope of the original contract. The sample is restricted to purchase orders in the years 2010 through 2020. The synthetic VA is generated from a pool of 47 federal agencies. The full list of agencies and their weight in the synthetic control specifications is presented in Appendix Table A.2.

Percentage shares $(\%)$	BPA Call	Definitive Contract	Delivery Order	Purchase Order
Contract value (\$1000's)	132.83	634.58	160.20	19.75
SDV	7.43	38.31	8.40	6.03
Non-disabled vet	2.63	3.74	4.40	4.03
Woman-owned	11.07	5.38	8.63	5.77
Minority-owned	5.32	4.44	3.81	4.51
Observations	24,692	18,704	324,362	262,966

Table 1: Summary Statistics Before Policy Change (2011-2014)

Restricting to Purchase Orders								
Percentage shares $(\%)$	SDV	Non-disabled vet	Woman/Minority	All other				
Contract value (\$1000's)	32.77	19.15	20.85	18.68				
Medical Products	58.70	61.28	59.51	71.00				
Maintenance/Repair	9.37	7.70	5.89	6.74				
IT/Tech	1.66	1.27	2.24	1.81				
Prof/Admin services	2.38	2.78	4.34	2.39				
Observations	15,863	10,586	24,265	212,252				

Includes all initial action contracts funded by VA from 2011 through 2014. All rows except contract values are denoted in percentage shares. Top panel reports shares by award type, and bottom panel reports shares by small business ownership status. SDV denotes service-disabled veteran owned small business.

	A. Outcome: Any VA Purchase Order Award						
	All Existing Winners (1)	Regular Winners (2)	Recent Entrants (3)	Sporadic Winners (4)	Previously Unsuccessful (5)		
Post*SDV	0.107^{***} (0.0103)	0.102^{***} (0.0158)	0.147^{***} (0.0204)	0.0991^{***} (0.0185)	0.0216^{***} (0.00329)		
R^2	0.399	0.473	0.369	0.303	0.405		
ymean	0.315	0.437	0.271	0.254	0.00221		
sdvmean	0.111	0.161	0.121	0.0713	0.0370		
N	125257	38896	29722	56639	336132		

Table 2: Difference-in-Differences Estimates (2013–2023)

B. Outcome: Log(Total Dollars Awarded)

	All Existing Winners (6)	Regular Winners (7)	Recent Entrants (8)	Sporadic Winners (9)	Previously Unsuccessful (10)
Post*SDV	0.573^{***}	0.774^{***}	0.501^{***}	0.153	1.085***
D ²	(0.0634)	(0.0854)	(0.143)	(0.118)	(0.415)
ymean	10.79	11.35	10.51	10.012 10.20	11.04
sdvmean	0.125	0.154	0.144	0.0749	0.547
N	35118	16053	6880	12185	590

Observations at firm-year level (defined from July of the previous year to June of the current year), and include firm and year FEs. Column 1 includes all firms that won a contract between 2010 and June 2012, while columns 2-5 represent mutually exclusive subgroups of firms. Panel B is conditional on having won an award in that period. For the any award outcome, the mean for SDV firms in 2015 equaled 0.39, 0.47, 0.36, 0.29, and 0.013. Standard errors clustered at firm level in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01

	VA		Non-VA I	Placebo:
	Months since	Indicator:	Months since	Indicator:
	Registration	Age ≤ 3	Registration	Age ≤ 3
	(1)	(2)	(3)	(4)
Post*SDV	-14.01***	0.0724^{**}	-5.191***	0.0544**
	(3.828)	(0.0342)	(1.835)	(0.0224)
Post*Woman/Minority	-1.003 (3.708)	-0.00334 (0.0227)	-2.276^{*} (1.162)	0.0373^{***} (0.0105)
SDV	-20.57^{***} (3.365)	0.217^{***} (0.0311)	-7.633^{***} (1.596)	0.206^{***} (0.0198)
Veteran	9.587^{***} (3.142)	-0.0132 (0.0148)	$0.318 \\ (1.052)$	0.0580^{***} (0.00835)
Woman/Minority	-2.687 (2.772)	0.0364^{*} (0.0187)	1.124 (0.998)	$\begin{array}{c} 0.0394^{***} \\ (0.00925) \end{array}$
Award Size (log dollars)	-0.979^{*} (0.557)	0.0100^{***} (0.00313)	-1.252^{***} (0.183)	$\begin{array}{c} 0.00821^{***} \\ (0.00144) \end{array}$
R^2	0.114	0.109	0.055	0.108
ymean	74.46	0.209	40.94	0.349
N	8455	8455	52302	52302

Table 3: Estimates of Age at First Award (2014–2023)

Includes one observation per firm, and additional controls include FEs for year, month, major product group, and 2-digit NAICS. Odd columns report estimates for months since initial SAM registration, and even columns for whether award was within 3 years of the business start date. Robust standard errors in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01

	(1)	(2)
	Registration Length	Gap in Registration
Post*SDV	0.114	0.00863
	(0.127)	(0.0357)
Post*Woman/Minority	0.00260	-0.00334
	(0.0969)	(0.0306)
SDV	0.0643	-0.0863***
	(0.119)	(0.0318)
Veteran	-0.0618	0.00221
	(0.0786)	(0.0237)
Woman/Minority	0.214**	-0.0715***
	(0.0840)	(0.0243)
Award Size (log dollars)	0.0699***	-0.0231***
/	(0.0130)	(0.00422)
R^2	0.686	0.043
ymean	5.703	0.370
N	6909	6909

Table 4: Estimates of Survival (2014–2021)

Includes one observation per firm, and additional controls include FEs for year, month, major product group, and 2-digit NAICS. First outcome measured as number of years between firm's entry and last registration date; second outcome is indicator for whether firm experiences a gap in registration. Robust standard errors in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01

	Any Award		$\log(\# \text{ of }$	awards)	log(dolla	ars awarded)
	(1)	(2)	(3)	(4)	(5)	(6)
post*SDV	0.0139	0.00540	0.0430	0.0383	-0.111	-0.193
	(0.0145)	(0.0146)	(0.142)	(0.142)	(0.237)	(0.247)
abu						
SDV	0.0746^{***}	0.0774^{***}	0.240^{**}	0.269^{**}	1.018***	1.034***
	(0.0107)	(0.0110)	(0.109)	(0.112)	(0.184)	(0.197)
initial size	0.00238^{***}	0.00187^{***}	0.0231^{**}	0.0259^{***}	0.0930^{***}	0.0905^{***}
	(0.000701)	(0.000705)	(0.00954)	(0.00950)	(0.0246)	(0.0243)
R^2	0.013	0.029	0.054	0.134	0.113	0.187
ymean	0.0574	0.0565	0.603	0.621	10.36	10.41
Controls		Х		Х		Х
N	66768	64066	3833	3616	3716	3503

Table 5: Estimates of Spillovers (2010–2023)

Observations at firm-year level, following firms 3 years after entry. All regressions include entry-year and year FEs. Additional controls include FEs for month, major product group, and 2-digit NAICS. Standard errors clustered at firm level in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01

	SDV Set-aside	SDV Award	No. of Offers	Multiple Offers	Delayed	Cost Overruns
	(1)	(2)	(3)	(4)	(5)	(6)
ATT	0.1309	0.2412	0.1667	0.0600	-0.0483	-0.0189
(Std. Error)	(0.0056)	(0.0247)	(0.2389)	(0.0868)	(0.0550)	(0.0646)
Pre-2016 Mean D.V.	0.0159	0.0628	1.4069	0.1636	0.0374	0.0194
No. of Agencies	47	47	47	47	47	47
No. of Observations	1,269	1,269	1,269	1,269	1,269	1,269

Observations at agency-half-year level. ATTs are computed using Arkhangelsky et al. (2021)'s implementation of the synthetic control method, with no covariates. Standard errors are computed using permutation methods, generating 50 placebo estimates where the treatment is assigned randomly to agencies in the control pool.

Appendix: Additional Figures and Tables



Figure A.1: Distribution of Award Values, by Award Type (2011 - 2014)

FPDS initial action contracts funded by VA from 2011 to 2014. Includes all contracts awarded by the VA to either an SDV or a non-veteran-owned business. Dashed line indicates threshold of \$1 million value. Number of observations equals 24,042 for BPA, 18,004 for DC, 310,089 for DO, and 252,380 for PO.



Figure A.2: Most Common Categories of VA awards

Total purchase order awards funded by VA in 2014 and 2017, by category, for the 5 most common categories in 2014. The remaining products and services are grouped together in Other Products or Other Services.





A. VA Awards



FPDS initial action contracts funded by VA. Measures calculated for half-year intervals.



Figure A.4: Dollar Value of Awards (in billions), by Award Type (FY2010 - FY2022)

FPDS initial action contracts funded by VA from FY2010 to FY2022. Each fiscal year runs from Oct of the prior year through Sept of the current.





Total number of switchers = 181. Restricted to first-time switchers.





A. SDV vs non-veteran small businesses

(N = 52,315) Each panel plots coefficient estimates from a pooled regression at the firm level. Outcome is measured as an indicator for whether the firm wins a federal award 3 years or more after entry. Controls include indicators for SDV, veteran, and woman/minority, and entry year FEs. Estimates are plotted with 95% confidence intervals using robust standard errors.



Figure A.7: Synthetic Control Outcomes Robust to Inclusion of Covariates (2010 - 2023)

This figure shows trends in two competition outcomes and two performance outcomes for the VA and a control group constructed using the synthetic control method. An observation is an agency by half-year. The sample is restricted to purchase orders in the years 2010 through first half of 2023. The synthetic VA is generated from a pool of 47 federal agencies, and matches on the outcome variable, as well as the set-aside share and log(mean contract value).



Figure A.8: Synthetic Control Outcomes Robust to Common Set of Weights (2010 - 2023)

This figure shows trends in two competition outcomes and two performance outcomes for the VA and a control group constructed using the synthetic control method. An observation is an agency by half-year. The sample is restricted to purchase orders in the years 2010 through first half of 2023. The synthetic VA uses a common set of weights across all outcomes, based on the optimal weights constructed for SDV set-aside share (6% for International Trade Commission, 18% for National Science Foundation, 17% for Securities and Exchange Commission, and 59% for Dept of Housing and Urban Development).

	All Existing	Regular	Recent	Sporadic	Previously
	Winners	Winners	Entrants	Winners	Unsuccessful
	(1)	(2)	(3)	(4)	(5)
Post*SDV	0.104^{***}	0.102^{***}	0.144^{***}	0.0898^{***}	0.0216^{***}
	(0.0101)	(0.0158)	(0.0198)	(0.0179)	(0.00329)
R^2	0.392	0.473	0.358	0.297	0.405
ymean	0.305	0.437	0.260	0.247	0.00221
sdvmean	0.106	0.161	0.110	0.0683	0.0370
N	135916	38896	34881	62139	336132

Table A.1: Robustness: Difference-in-Differences Estimates (2015–2023)

Observations at firm-year level (defined from July of the previous year to June of the current year), and include firm and half-year FEs. Column 1 includes all firms that won a contract between 2010 and June 2012, while cols 2-5 represent mutually exclusive subgroups of firms. As a robustness check, this table includes all existing award winners, even awards below \$5k. Standard errors clustered at firm level in parentheses * p < 0.10, ** p < 0.05, *** p < 0.01

	Specification					
Agency	SDV Set-aside	SDV Award	No. of Offers	Multiple Offers	Delaved	Cost Overruns
rigency	(1)	(2)	(3)	(4)	(5)	(6)
	(1)	(2)	(0)	(1)	(0)	(0)
Government Accountability Office	0.00	0.00	0.12	0.01	0.00	0.00
Department of Agriculture	0.00	0.00	0.00	0.00	0.00	0.00
Department of Commerce	0.00	0.00	0.00	0.00	0.00	0.00
Department of the Interior	0.00	0.00	0.00	0.00	0.00	0.00
Department of Justice	0.00	0.00	0.00	0.00	0.00	0.00
Department of State	0.00	0.00	0.00	0.00	0.00	0.00
Department of the Treasury	0.00	0.00	0.00	0.00	0.00	0.00
Office of Personnel Management	0.00	0.00	0.04	0.02	0.13	0.04
Federal Communications Commission	0.00	0.00	0.00	0.00	0.00	0.00
Social Security Administration	0.00	0.00	0.08	0.00	0.00	0.00
Nuclear Regulatory Commission	0.00	0.00	0.00	0.00	0.00	0.03
International Trade Commission	0.06	0.00	0.00	0.00	0.00	0.00
Equal Employment Opportunity Commission	0.00	0.00	0.07	0.09	0.00	0.00
General Services Administration	0.00	0.81	0.00	0.00	0.01	0.07
National Science Foundation	0.17	0.00	0.01	0.00	0.10	0.00
Securities and Exchange Commission	0.17	0.00	0.16	0.18	0.00	0.03
Bailroad Retirement Board	0.00	0.00	0.00	0.00	0.00	0.02
Consumer Product Safety Commission	0.00	0.00	0.00	0.00	0.00	0.00
Environmental Protection Agency	0.00	0.00	0.00	0.00	0.00	0.00
Department of Transportation	0.00	0.00	0.00	0.00	0.00	0.00
Department of Homeland Security	0.00	0.00	0.00	0.00	0.00	0.00
Agency for International Development	0.00	0.00	0.00	0.00	0.00	0.01
Small Business Administration	0.00	0.06	0.00	0.00	0.00	0.00
Department of Health and Human Services	0.00	0.00	0.00	0.00	0.00	0.00
National Aeronautics and Space Administration	0.00	0.00	0.00	0.00	0.00	0.00
Export-Import Bank of the US	0.00	0.00	0.32	0.17	0.00	0.02
Department of Housing and Urban Development	0.60	0.00	0.00	0.00	0.00	0.00
National Archives and Records Administration	0.00	0.00	0.00	0.00	0.00	0.00
Department of Energy	0.00	0.00	0.00	0.00	0.00	0.00
Department of Education	0.00	0.00	0.00	0.00	0.00	0.00
Department of Defense	0.00	0.00	0.00	0.00	0.00	0.00
Executive Office of the President	0.00	0.11	0.11	0.10	0.00	0.00
Peace Corps	0.00	0.00	0.00	0.00	0.00	0.00
Department of Labor	0.00	0.00	0.00	0.00	0.00	0.00
Pension Benefit Guaranty Corporation	0.00	0.00	0.03	0.00	0.00	0.00
Smithsonian Institution	0.00	0.00	0.00	0.32	0.19	0.00
National Gallery of Arts	0.00	0.00	0.00	0.00	0.00	0.00
Commodity Futures Trading Commission	0.00	0.00	0.00	0.00	0.00	0.00
Defense Nuclear Facilities Safety Board	0.00	0.00	0.00	0.00	0.00	0.00
Federal Election Commission	0.00	0.02	0.00	0.00	0.19	0.00
Merit Systems Protection Board	0.00	0.00	0.00	0.00	0.27	0.02
National Endowment for the Arts	0.00	0.00	0.00	0.00	0.01	0.01
National Labor Relations Board	0.00	0.00	0.00	0.00	0.01	0.00
National Transportation Safety Board	0.00	0.00	0.00	0.11	0.00	0.00
Corporation for National and Community Service	0.00	0.00	0.05	0.00	0.00	0.73
US Agency for Global Media	0.00	0.00	0.00	0.00	0.09	0.01

Table A.2: Synthetic Control Weights

Observations at agency-half-year level. Table shows weights assigned to each agency in the construction of the synthetic VA, in each of the six specifications in Table 6. Weights are computed using Arkhangelsky et al. (2021)'s implementation of the synthetic control method, with no covariates.

	Any Delay	Days Delayed	Relative Delays	Any Overrun	Cost Overruns	Cost Overruns	Terminated
					(dollars)	(relative to budget)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ATT (Std. Error)	-0.0483 (0.0550)	-16.3260 (40.0700)	-0.0209 (0.0957)	$\begin{array}{c} 0.0184 \\ (\ 0.0612) \end{array}$	-6098.9174 (26795.2273)	-0.0189 (0.0646)	-0.0019 (0.0110)
Pre-2016 Mean D.V.	0.0374	6.2564	0.0611	0.2069	926.0567	0.0194	0.0020
No. of Agencies	47	47	47	47	47	47	47
No. of Observations	1,269	1,269	1,269	1,269	1,269	1,269	1,269

Observations at agency-half-year level. ATTs are computed using Arkhangelsky et al. (2021)'s implementation of the synthetic control method, with no covariates. Standard errors are computed using permutation methods, generating 50 placebo estimates where the treatment is assigned randomly to agencies in the control pool. Delays are defined as modifications within the scope of the original contract resulting in an actual duration that is longer than originally expected. In column 1, the dependent variable is the share of awards with any delay. In column 2, is the average days of delay. In column 3, is the average days of delay relative to the expected duration. Cost overruns are defined as differences between actual spending and originally expected spending, that arise due to modifications within the scope of the original contract. In column 4, the dependent variable is defined as the share of awards with any cost overrun. In column 5, is the average dollars of overrun. In column 6, is the average dollars of overrun as a share of the initial budget. Finally, in column 7 the dependent variable is the share of contracts that are terminated before completion.

	SDV Set-aside	SDV Award	No. of Offers	Multiple Offers	Delayed	Cost Overruns
	(1)	(2)	(3)	(4)	(5)	(6)
ATT	0.1290	0.1961	-0.1527	-0.0475	-0.0398	-0.0555
(Std. Error)	(0.0063)	(0.0186)	(0.2392)	(0.1394)	(0.0636)	(0.1046)
Pre-2016 Mean D.V.	0.0159	0.0628	1.4069	0.1636	0.0374	0.0194
No. of Agencies	47	47	47	47	47	47
No. of Observations	1,269	1,269	1,269	1,269	1,269	1,269

Table A.4: Robustness of Synthetic Control Estimates to Inclusion of Covariates

Observations at agency-half-year level. ATTs are computed using Arkhangelsky et al. (2021)'s implementation of the synthetic control method, matching on outcome variable, set-aside share, and log(mean contract value). Standard errors are computed using permutation methods, generating 50 placebo estimates where the treatment is assigned randomly to agencies in the control pool.