

Optimal Working Paper Series

The effects of set-aside procurement on the availability of Women-Owned Small Businesses in federal contracting

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Introduction

Women business owners and entrepreneurs face a greater variety and severity of challenges in starting and growing their businesses than men.^{1,2} Financial barriers represent one of the largest hurdles faced by women-owned firms as they have less startup capital, more difficulty securing loans through formal financial institutions, and less credit history.³ They also have difficulties obtaining government contracts.^{4,5} Fiscal Year (FY) 2019 was the second time in the last seven years that the federal government met the procurement goal of awarding at least 5 percent of contracts and subcontract dollars to women-owned small businesses (WOSBs), awarding 5.2 percent or \$26 billion in federal contracts to WOSBs.⁶

The federal government policymakers have designed and implemented policies and programs intended to reduce disparities based on gender and race in accessing the government procurement market. There are numerous federal programs that assist small businesses in accessing federal contracting opportunities. The Small Business Administration (SBA) Women-Owned Small Business Federal Contracting (WOSB) Program is one of several certification programs Congress has approved to provide greater opportunities for small businesses to compete in the federal marketplace. The purpose of the WOSB Program is to restrict competition to qualified WOSBs to increase “their success to compete for and win federal contracts” and ensure “a level playing field on which such small businesses can compete for Federal contracting opportunities.”⁷ The WOSB Program allows procurement officials to select an acquisition and to restrict competition to two types of firms, Economically Disadvantaged Women-Owned Small Businesses (EDWOSBs) and WOSBs. A procurement official can set aside an acquisition for restricted competition in a North American Industry Classification System (NAICS) code in which WOSBs and EDWOSBs were found to be “underrepresented” or “substantially underrepresented.”^{8,9,10,11,12}

Research Objectives

The recent evaluation of the WOSB Program reported a large degree of disparity in WOSBs’ access to federal contracts and a low availability of WOSBs in most of the NAICS codes. Most of the 6-digit NAICS codes (82.2%)¹ were classified as having a WOSB disparity for the number of contract awards.¹³ However, the evaluation did not examine changes over time in WOSB availability nor explored the correlates of WOSB availability in the federal procurement. This study explores the changes in the availability of WOSBs that are ready, willing, and able to perform federal contracting in response to federal agencies’ use of the WOSB and other types of set-asides and sole-source contracts. It is expected that the changes over time in federal agencies’ use of WOSB set-asides and sole-source contracts will be correlated to the changes in availability of WOSBs that are ready, willing, and able to perform federal contracts. Specifically, it is hypothesized that the expected increase over time in the use of set-asides and sole-source contracts will be correlated to the increase in the WOSB availability. The results are expected to provide inferences to the degree to which the WOSB availability in the federal procurement could be potentially improved by the federal government efforts to increase set-asides and sole-source contracts.

This study will first provide the operational definitions of the disparity, followed by the description of the methodological approach. Then, the descriptive results will be presented for the disparity and availability of WOSBs in federal procurement over time. In addition, the study will identify industries with the lowest and highest availability of WOSBs. Then, the main focus of the analyses will be to explore the relationship of WOSB and other types of set-asides contracts to WOSB availability in the federal procurement. Finally, conclusions and recommendations will be outlined.

Definitions of Availability, Utilization, and Disparity

¹ The first two digits of the NAICS code designate the economic sector, the third — the subsector, the fourth — the industry group, the fifth — the NAICS industry, and the sixth digit designates the national industry specific to the United States, Canada, and Mexico.

There is a variety of measures used by the studies and program evaluations examining the gender, race/ethnicity, and other groups' differences in health, illness, socioeconomic, and other outcomes.¹⁴⁻¹⁵ This study used the disparity ratio approach to estimate the representation of WOSBs in obtaining federal contracts. A disparity ratio measures the degree to which firms of a given type (e.g., women-owned) are represented in federal contracting in proportion to their prevalence in the reference population. This measure of the representativeness in access to federal contracts is the established, validated, and often used approach in disparity studies.^{16,17,18}

The disparity ratio is measured as the ratio of two ratios:

- (1) the utilization ratio (the ratio of the contracts awarded to WOSBs to the contracts awarded overall),
divided by
- (2) the availability ratio (the ratio of the number of WOSBs to the total number of firms in the reference population, e.g., firms that are ready, willing, and able to perform federal contracts).

If the disparity ratio is equal to 1.0, there is a parity and WOSBs are awarded contracts in the same proportion as their representation in the population. If the ratio is greater than 1.0, WOSBs are overrepresented relative to their share of total businesses. If the ratio is less than 1.0, then there is a disparity and WOSBs are underrepresented as government contractors relative to their share of total businesses in the population.

The disparity could be calculated for two measures of WOSBs' utilization of federal procurement: 1) the number of contracts, and 2) the value or obligations of contracts. This accounts for the fact that underrepresentation can occur when WOSBs receive a relatively large number of contracts, but the awards are proportionally low value, as well as when WOSBs receive a relatively small number of high-value contract awards. This study focuses on the number of contracts as the measure of the utilization.

Methods

Data Sources

The study used the following secondary data sources to calculate the availability and utilization ratios for the population of firms in the United States that are ready, willing, and able to perform federal contracts.

- *System for Award Management (SAM) 2014-2019*. This is a government-wide data source that contains information for the characteristics of federal contractors and their businesses. The relevant data elements included the firm characteristics (e.g., six-digit NAICS codes), and the SBA certifications (e.g., WOSB). We used these data to calculate the availability ratios for the "ready, willing, and able" population.
- *Federal Procurement Data System (FPDS) 2014-2019*. This is a single source for U.S. government-wide procurement data run by the U.S. General Services Administration. The relevant data elements included the date, number, and obligations of federal contracts awarded, as well as the type of awards (e.g., set-aside, multiyear). We used the composite version of the FPDS to calculate the utilization ratios for the "ready, willing, and able" population of firms registered in SAM to conduct business with the government.

Data Management Procedures

Availability ratio was calculated using SAM for all months in a given year and for all NAICS codes, not just the firm's primary NAICS code. This was done to reflect the fact that firms can win awards in all of their selected NAICS codes and not just a primary NAICS code. The award start and end dates in the composite version of FPDS-NG were used to identify awards by year for the time period of 2014-2019. The data from individual contract actions were aggregated into contracts based on the contract numbers in the file, excluding observations with invalid or missing NAICS codes. A unique contract award was

defined in this study as a standalone contract award not associated with an Indefinite Delivery Vehicle (IDV). Individual task order awards under a single IDV or different IDVs were also counted as unique contract awards. Another data management procedure involved removing duplicate records from SAM. For firms that maintained entries for multiple establishments, only one entry was kept based on identifying the records that were identical (i.e., employment, revenue, start date) except for the location. Fully duplicate records were removed. The firms that only competed for grants were also removed.

The study also omitted disparity ratio results for NAICS codes that are not eligible for federal contracts based on Federal Acquisition Regulations (FAR), including “5211 Monetary Authorities-Central Bank,” “8141 Private Households,” “55 Management of Companies and Enterprises,” “92 Public Administration,” “42 Wholesale Trade,” “44 Retail Trade,” and “45 Retail Trade.” The analytical dataset included 865 6-digit NAICS code for industries eligible for federal procurement 2014 to 2019 with contract awards.

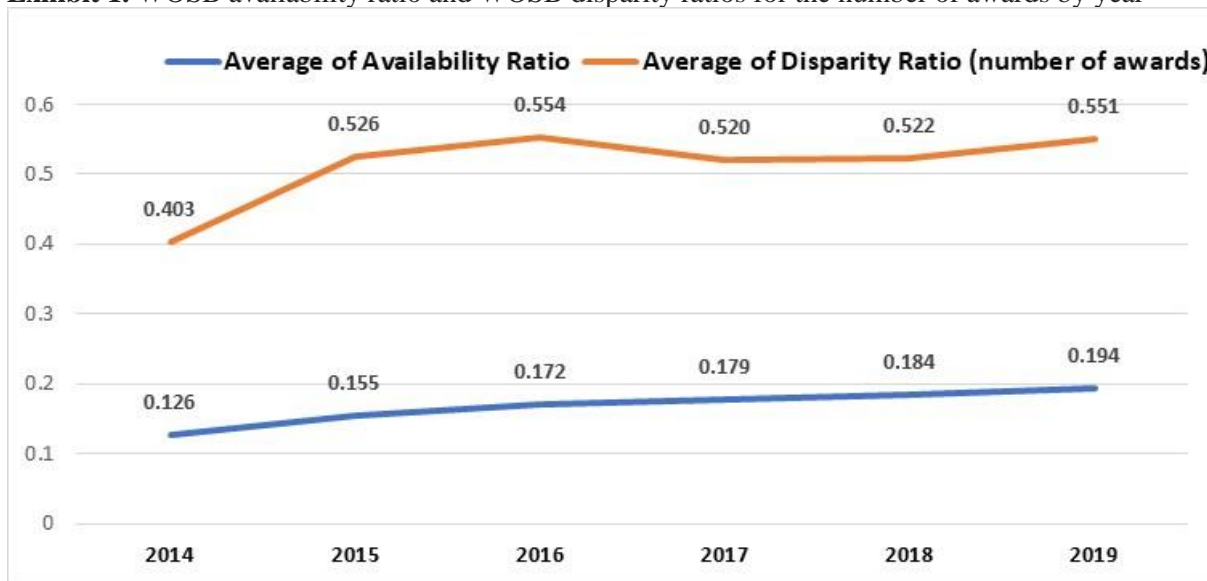
To test the hypothesis, the study used the mixed models to examine the relationship of the proportions of various types of set-aside contracts to the outcome of the WOSB availability ratio, 2014 to 2019. The unit of analysis was the 6-digit NAICS code for industries eligible for federal procurement (n=865). The dependent variable was the availability ratio, and the key independent variable was the proportion of various types of set-aside contracts, including WOSB, 8(a), HUBZone, veteran, small business, and total. The proportions of set-aside contracts were lagged for one, two, and three years to reflect the time it takes for the WOSBs to learn about, apply for, and win set-asides contracts.

Results

Descriptive Results

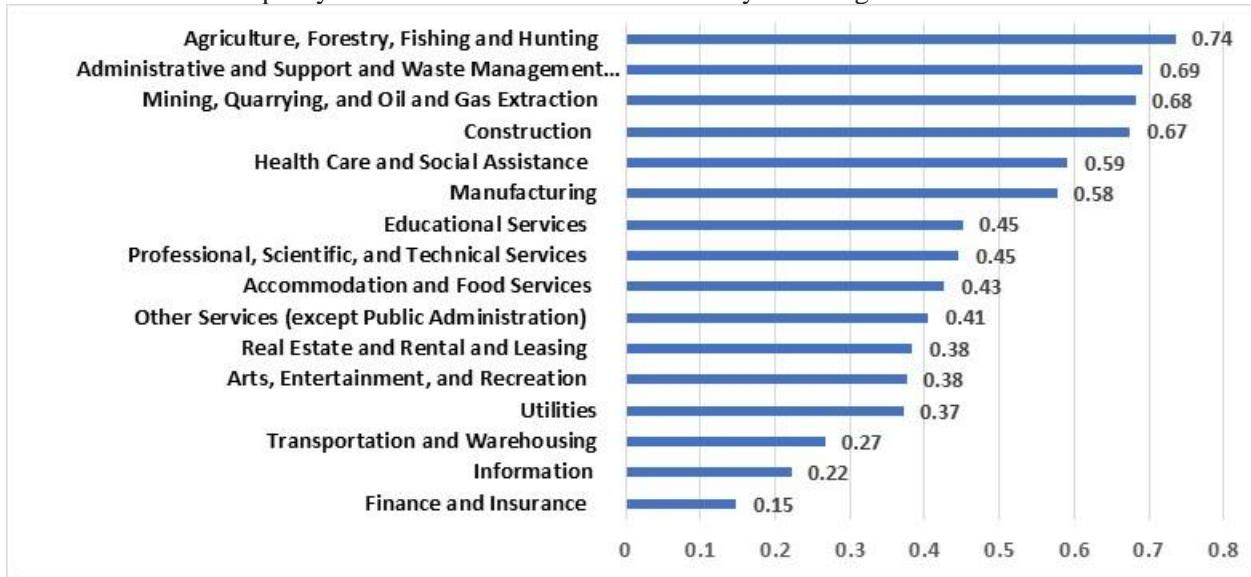
The average disparity ratio across the industries increased 2014-2016 and then leveled off (Exhibit 1). There was a substantial WOSB disparity for the number of contracts. The WOSB availability ratio was very small and slightly and steadily increased 2014-2019.

Exhibit 1. WOSB availability ratio and WOSB disparity ratios for the number of awards by year



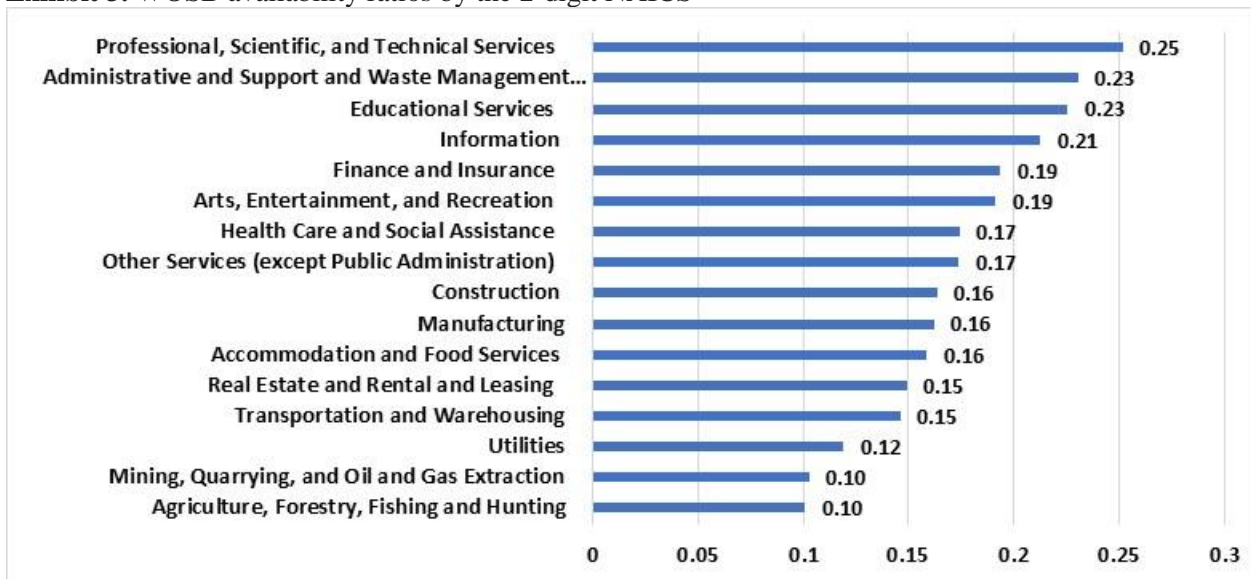
The WOSB disparity ratios the number of contacts varied by the 2-digit NAICS (Exhibit 2).

Exhibit 2. WOSB disparity ratios for the number of contacts by the 2-digit NAICS



The WOSB availability ratios also varied by the 2-digit NAICS (Exhibit 3).

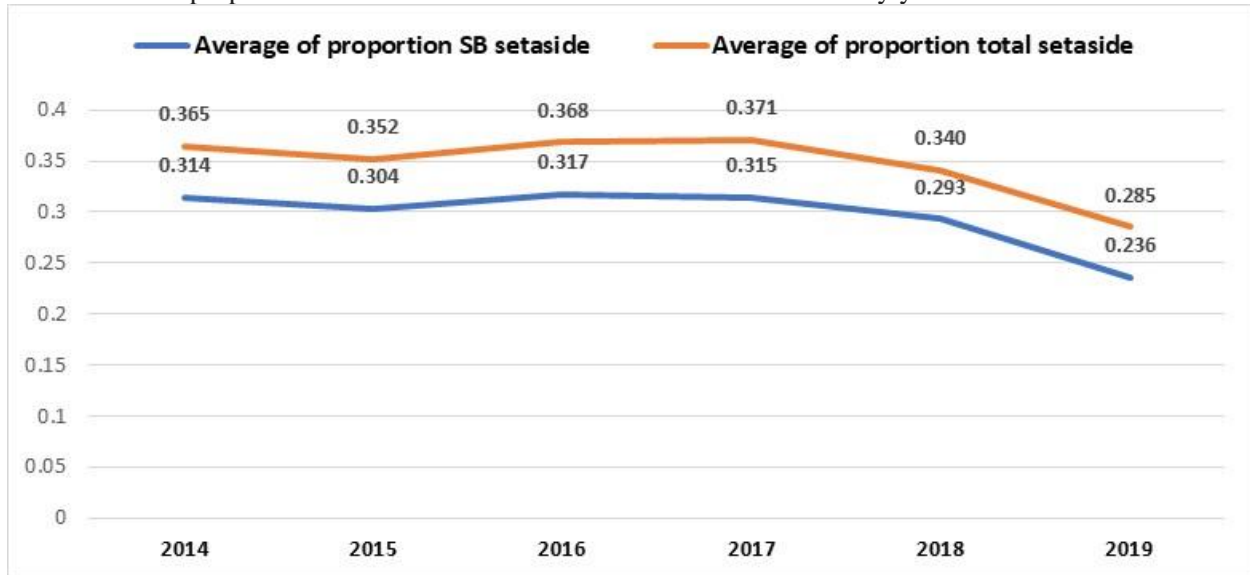
Exhibit 3. WOSB availability ratios by the 2-digit NAICS



Set-Aside Contracts

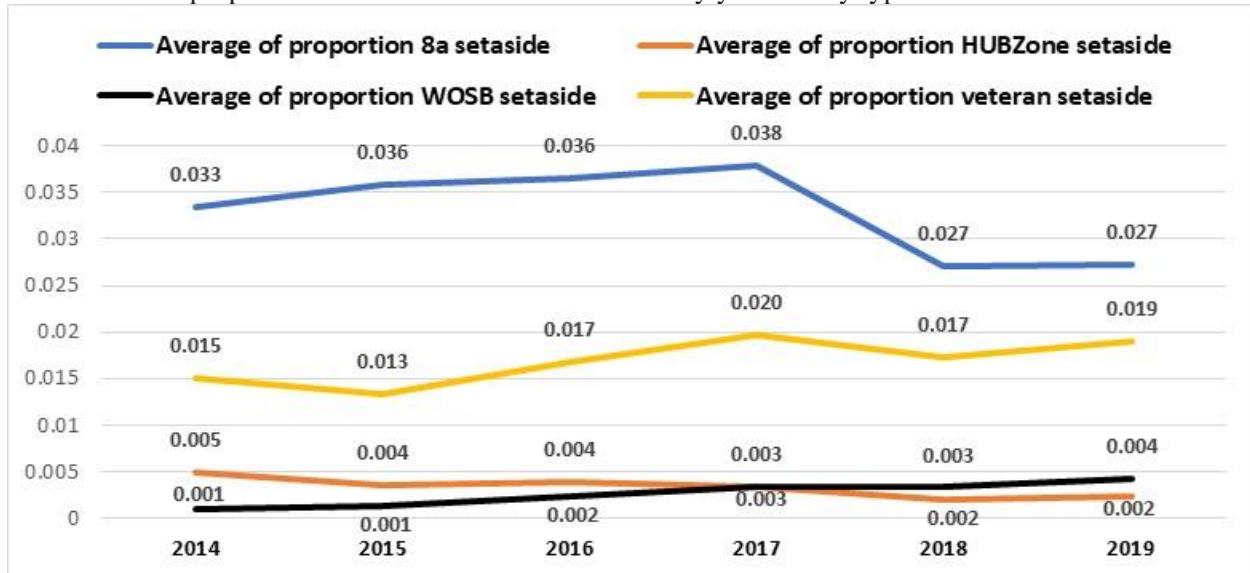
The average proportion of total set-aside contracts, at the NAICS level, was roughly about a third and slightly decreased in 2017 and 2018 (Exhibit 4). Small business set-aside contracts accounted for the most set-aside contracts.

Exhibit 4. The proportion of total and small business set-aside contracts by year



The average proportions of WOSB and other types of set-aside contracts, at the NAICS level, were very small (Exhibit 5). The average proportions of WOSB set-aside contracts slightly and steadily increased 2014-2019.

Exhibit 5. The proportion of all other set-aside contracts by year and by type



There is also a variability in the proportion of total and WOSB set-aside contracts by the 2-digit NAICS (Exhibits 6 and 7).

Exhibit 6. The proportion of total set-aside contracts by the 2-digit NAICS

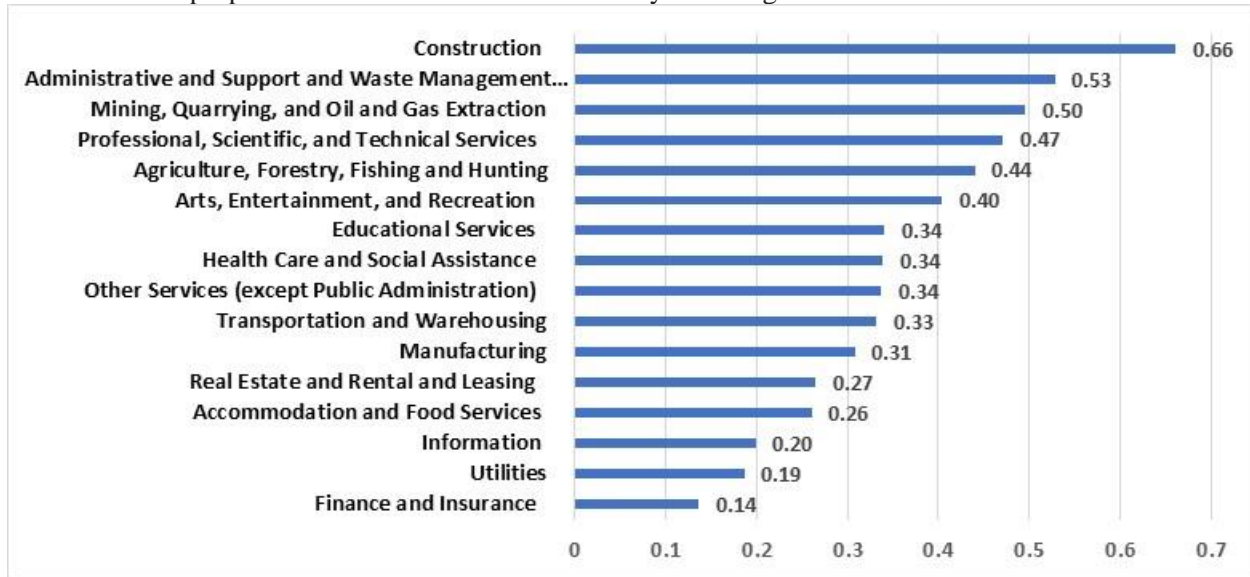
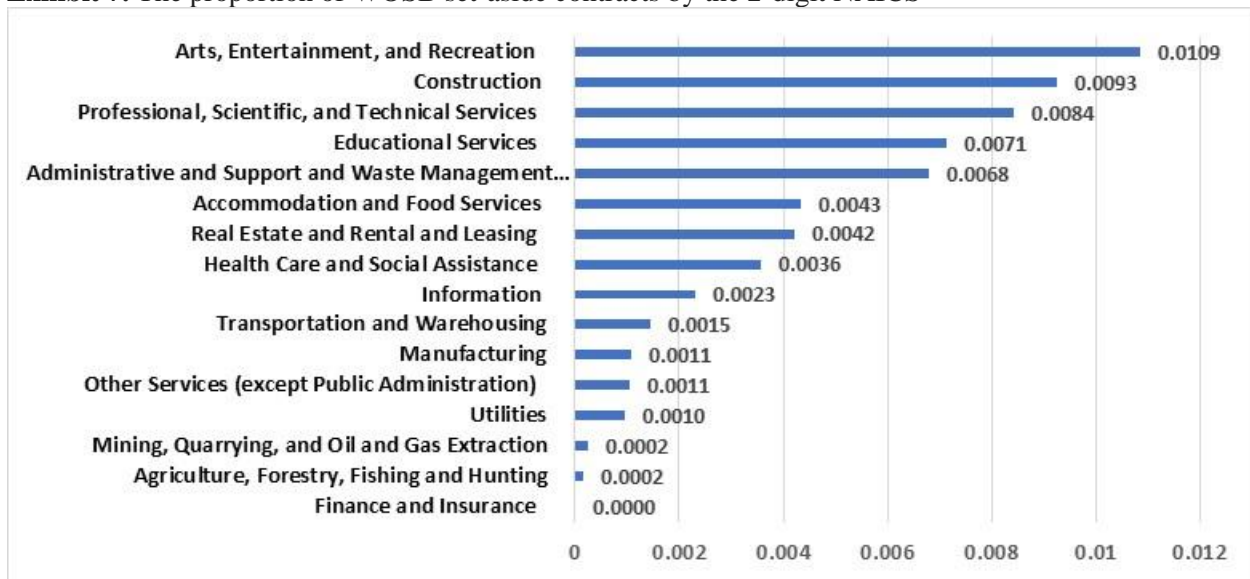


Exhibit 7. The proportion of WOSB set-aside contracts by the 2-digit NAICS



The Relationship of WOSB Availability and Set-Aside Contracts

The results of the multivariate analyses revealed that all six models (for each type of and the total set-aside contracts) had a significant positive effect for each year, indicating a continuous significant increase in the availability ratio over the years. The results for the proportion of WOSB set-aside contracts revealed the significant effect on availability ratio only for the 3-year lag (Table 8). The Biden Administration recently announced that it intends to increase its WOSB goal from 5% to 7% by FY2023. To reach these goal might alter WOSB set-asides. For instance, if WOSB set-asides were to increase by 40% in FY2022 (e.g., in Professional, Scientific, and Technical Services [NAICS=54] WOSB set-asides increase from 0.84% of contracts to 1.17% of contracts), then we would expect the availability of WOSBs to increase by 10.8% (from by 25% to 27.7%) by 2025. Based on the FY2019 data, this would translate into approximately 4,600 more WOSBs in Professional, Scientific, and Technical Services. Our models also suggest that this same change in WOSB set-asides would increase the availability of WOSBs in Construction by more than 3,200.

Despite the Biden Administration’s stated goal to increase WOSB procurement by 40%, federal procurement officials typically leverage other types of set-asides that also benefit WOSBs. For instance, WOSBs that have multiple certifications (i.e., 8a, HUBZone) also benefit from 8a and HUBZone set-asides. If federal procurement officials were to increase 8a set-asides by 33% in FY2022 then our models suggest that the availability of WOSBs would increase by 0.89% in FY2024 and by 0.92% in FY2025. A comparable increase in HUBZone set-asides is estimated to increase the availability of WOSBs by 1.09% in FY2023 and would then a diminishing and statistically significant effect on the availability of WOSBs in subsequent years.

Table 8. The coefficients for the proportion of set-asides by year lag

Set-Aside	1-year lag	2-year lag	3-year lag
WOSB	.005	.167	.271*
8(a)	.013	.027**	.028**
HUBZone	.033*	.028*	.026*
Small business	.001	.004	.006*
Total	.001	.005	.008**

Note: * p<.05; **p<.01.

Note: veterans’ set-asides were not significant.

The sensitivity analyses explored controlling for the industry procurement size (the total number and the total obligation of federal awards), the disparity ratio, and the proportion of set-asides squared. The results remained stable when controlling for industry size. The non-linear relationship of the proportion of set-asides was not significant. Furthermore, modeling all types of set-asides in one model revealed the significant effect for 8(a) set-asides only. The sensitivity analyses also explored the log transformed number of WOSBs as the outcome measure.

Conclusion

Descriptive results were consistent with other reports indicating that the WOSB set-aside and sole source contracts account for a relatively small portion of the total contracts awarded to WOSBs. Most of the WOSBs federal contracts are awarded in full and open competition with other firms and relatively few federal contracts are awarded through the WOSB program.¹⁹ Furthermore, the descriptive results revealed a variability among the industries in the WOSB disparity ratio, availability ratio, and proportion of set-aside contracts.

The results of the analyses testing the hypothesized increase over time in the WOSB availability in the federal procurement market as a function of the increase in the set-asides and sole-source contracts suggested that the proportion of set-asides and sole-source contracts positively related to the WOSB availability ratio. There were significant effects for the 3-year lag of WOSB set-asides contracts. There were also significant lagged effects for the other types of set-asides contracts.

Overall, the results suggest that it takes two to three years for the set-aside contracts to have an effect on increasing the availability of WOSBs in the federal procurement. This delay is likely due to the time it takes for WOSBs to learn about the set-aside procurement opportunities, obtain necessary certificates, apply for the WOSB and other programs, get approved, bid on contracts, and finally win the contracts. The results imply that WOSB availability in federal procurement could be potentially improved by increasing the set-asides and sole-source contracts.

This study is exploratory in nature and needs to be followed by more rigorous investigations. The future research should use SAM and FPDS data to conduct more complex models; for example, using WOSBs as the unit of analyses on a panel data for more than six years. This will provide a more thorough evaluation of the 3-year lag. Furthermore, this will allow us to explore and control for the business

characteristics of firms, such as age, size (revenue and number of employees), type (e.g., for-profit, Limited Liability Companies), and others. The results would suggest the profile of firms with characteristics that relate to WOSBs participation in federal procurement. This might have implications for improving targeted outreach to firms.

Another future research avenue is to examine the factors and processes underlying the lag of the relationship of the set-aside contracts to WOSB availability in the federal marketplace. This will require using WOSBs as the unit of analyses on a panel data for more than six years, as well as obtaining the SBA administrative data on certification times for the WOSB program. This investigation will allow to examine how the certification time relates to the lag in WOSBs winning contracts. It will also allow the identification of firm characteristics related to the certification times. The results might have implications for improving certification and application procedures and processes to facilitate WOSBs participation in federal procurement.

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¹²Code of Federal Regulations, Title 13, Chapter I, Part 127 - Women-Owned Small Business Federal Contract Program §127.503 [https://ecfr.federalregister.gov/current/title-13/chapter-I/part-127#p-127.503\(b\)](https://ecfr.federalregister.gov/current/title-13/chapter-I/part-127#p-127.503(b))

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