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Comparing Online B2G Marketplaces: Purchasing Agent Preferences and Price Differentials

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Abstract

Language within the 2018 National Defense Authorization Act (NDAA) seeks to improve the federal acquisition of commercial products through agency use of commercial e-commerce portals, requiring the General Services Administration (GSA) to establish a program and enter into contracts with commercial portal providers. While the GSA has long supported agencies through its own business-to-government (B2G) portal, *Advantage*, little is currently known about how commercial portals and their associated business-to-business (B2B) or B2G marketplaces may be able to support the needs of federal agencies and their personnel who acquire commercial products. Accordingly, our research seeks to identify comparative advantages and disadvantages of the federal government's largest online B2G marketplace, *GSA Advantage*, with a leading private-sector B2B marketplace, Amazon's *Amazon Business*. We focus on the benefits and limitations of each platform for government purchase cardholders, comparing prices, shipping costs, shipping time, ease of use, and customer satisfaction, while considering future improvement initiatives. Our findings highlight several benefits, limitations, and risks of each platform for repetitive, purchase card-based transactions.

Introduction

Section 846 of the Fiscal Year (FY) 2018 National Defense Authorization Act (NDAA), *Procurement Through Commercial E-Commerce Portals*, requires the General Services Administration (GSA) to contract with private-sector marketplaces to satisfy government demand for commercial off-the-shelf (COTS) products. The intent of this program is to improve alignment between public-sector practices for the acquisition of COTS products and those of the private sector (GSA, 2018), while providing for enhanced competition, faster purchasing, improved government insight into the supply market, and reasonableness in prices paid by the government (Pub. L. No. 115-91). Prior to its passage, the provision gained the title "The Amazon Amendment" (Miller, 2017) within the popular press, a label indicative of recent efforts by proprietors of private-sector online marketplaces such as the Amazon.com corporation to further capture federal demand within the nearly

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\$53 billion spent annually by federal agencies on commercial items (The Coalition for Government Procurement, 2017). Many of these online marketplaces, including Amazon's *Amazon Business* B2B marketplace, are well-suited for use by industrial purchasers because of the business-oriented functionality offered, such as online requests for proposals, reverse auctioning, graduating pricing, and access to a wide range of goods and services. These marketplaces may also be able to readily adapt to idiosyncratic regulatory requirements faced by federal purchasers (e.g., Buy American Act, Javits–Wagner–O'Day Act, vendor exclusion) as well as needs and objectives specific to federal organizations, such as those related to access, transparency, supply chain security, and socioeconomic participation.

One area of federal spend that is particularly attractive to these marketplace proprietors is the nearly \$19 billion in purchases that occur annually for commercial items under the Government Purchase Card (GPC) program (GAO, 2016). In recent years, agency GPC purchase requirements have increasingly been made through GSA's own *GSA Advantage* platform and under GSA Multiple Award Schedule (MAS) contracts (where annual obligations total more than \$30 billion; GAO, 2015). The *GSA Advantage* purchasing platform has been designed around the unique requirements that exist for a B2G marketplace, and the underlying schedule contracts provide terms and conditions that protect the interests of federal buyers as well as those of the contracted, private-sector vendors. The platform also provides access to several strategic sourcing contract vehicles such as those under the Federal Strategic Sourcing Initiative's programs for office products and maintenance, repair, and overhaul supplies. Despite the numerous benefits, *GSA Advantage* and the MAS contracts continue to lose regulatory ground. For instance, prior to 2014 (FAC 2005-72-1), federal supply schedules were prioritized ahead of commercial sources in the Federal Acquisition Regulation (FAR), but are now placed in a "non-mandatory" status, on-par with commercial sources. Section 846 of the 2018 NDAA may further shift a large portion of the remaining spend away from *Advantage* and toward private-sector sellers via online marketplaces. Thus, it is important to gain a better understanding into differences (and commonalities) that exist between government-operated and industry-operated marketplaces and how federal purchasers view these platforms. To do so, we examine two marketplaces, *GSA Advantage* and *Amazon Business*, and focus our research on use under the federal GPC Program given its gravity and importance to both sectors. This report provides a brief overview of our research and findings.

As with any research, there were limitations. Due to time constraints, we limited our research to only Air Force historical GPC data and surveyed only Air Force members affiliated with the GPC. While the results contained in this report are specific to the Air Force, we have no reason to believe they are not generalizable to the entire federal government. Also, due to time constraints, we were limited in the number of exact item price comparisons that we could perform. We focused on comparing prices of 60 commercially available items (i.e., not military specific, which would bias results toward *GSA Advantage*) most frequently purchased by the Air Force in FY 2015. Further, while supply chain issues and legal concerns are relevant and prevalent, these types of risks are outside the scope of this study and were not addressed. Examples of these risks include brand protection, supply chain integrity, counterfeit items, product tampering, cardholder and supplier security, and Berry Amendment concerns.



Research Methodology

We adopt a multi-method approach to gain an understanding of *GSA Advantage's* and *Amazon Business's* relative positions in the overall 'market of online marketplaces' for the government buyer. First, we gathered qualitative information from interviews with management of *GSA Advantage*. Next, we corroborate and extend findings from these interviews using survey data collected from 428 Air Force members affiliated with the GPC (e.g., cardholders, approving officials). Lastly, we tested for price differentials between *GSA Advantage* and *Amazon Business* using a market basket of products developed from Air Force spend data.

Interviews

We sought to interview leaders from both the GSA and Amazon. We developed similar interview questions for both platforms. As *GSA Advantage* is listed in the FAR as a supply source and *Amazon Business* is not, we tailored our questions for each entity. The interview questions asked about current goals for the respective marketplace, customer service, policies, and continuous improvement processes. The questions also explored small business processes and the potential to achieve greater insight into federal GPC transactions. Interview requests were forwarded, along with interview questions, to each company's point of contact. While we were unable to arrange for an interview with Amazon, GSA agreed to participate.

Survey

We surveyed Air Force members affiliated with the GPC to better understand current platform use (for GSA and Amazon.com platforms) and trends as well as individual preferences and demographics. For each platform that the respondent had experience with, we obtained respondent ratings on product search, pricing, shipping, and return policies. Respondents were also asked to rate their level of satisfaction with the platform and indicate preference, if any, between platforms. A pre-test was used to further develop and refine the survey instrument with a pool of GPC subject matter experts. To ensure a sufficient level of response (i.e., to obtain a suitable level of statistical power for subsequent analysis), we coordinated distribution of the survey through the Air Force Installation Contracting Agency and to Air Force Level-Three Agency/Organization Program Coordinators (A/OPCs), who distributed the survey to base-level A/OPCs. Installation-level A/OPCs forwarded the survey to individual cardholders within their area of responsibility. The survey was deployed in a single wave, and 428 responses were received from a pool of 24,610 potential respondents, representing 1.74% of the total cardholder population.

Comparative Price Differentials

A price comparison was conducted between *GSA Advantage* and *Amazon Business* using a market basket approach. The market basket was developed using GPC data from FY 2015, consisting of 1,048,575 line items, obtained from the Air Force Installation Contracting Agency. Top categories of spend were (1) computers, computer peripheral equipment and software; (2) medical, dental, ophthalmic, hospital equipment and supplies; (3) industrial supplies; (4) stationary, office supplies, printing and writing paper; and (5) business services. Unfortunately, product and service identifiers were sparse and inconsistent within the dataset. A text frequency analysis was performed to develop the market basket, identifying the 60 most commonly purchased items based on textual information and percentage of spend on that item within the overall dataset. We excluded items that were commercial yet specific enough to the military that the items would not be commonly sold in a private-sector marketplace from the basket.



After identifying the 60-item market basket, we proceeded to collect item-level prices from each platform. Due to the abbreviated nature of the text descriptions in the GPC dataset, matching exact items on both platforms proved difficult. We found it most efficient to search from *GSA Advantage* first, and then match the item on *Amazon Business*. However, regardless of which platform we first searched for an item, the nature of the search results did not change. After matching the exact item, we documented purchase data from the five lowest cost vendors of that item. However, not every item could be matched to five vendors on both platforms. In those cases, we collected data from all available vendors. We captured the following details from each platform: (1) item description; (2) manufacturer part number; (3) vendor name; (4) price; (5) socioeconomic designation, if any; (6) vendor rating, if any; (7) quantity discount; if any; (8) shipping days; (9) pack-size; (10) product origin; (11) fulfillment source; (12) minimum purchase requirement, if any. These item details were compared across marketplaces.

Research Results

Interview

Our interview with the GSA occurred in August 2017. The interviewee worked for the organization for 15 years and was a self-described “technologist by heart.” The interviewee is now a division director for 27 systems and 70 brick-and-mortar stores across the United States. The interviewee provided insight into *GSA Advantage* during two one-hour interview sessions, which occurred via teleconference. After the interviews, the interviewee also emailed several written responses. We summarize this interview next.

Current State and Goals

The interview began with a discussion on the current state and goals of *GSA Advantage*. The interviewee stated that the primary goal for *GSA Advantage* is to “provide a government marketplace that is compliant with federal, military, and state and local government rules and regulations to deliver quality products and services to government buyers and to promote fair and equal competition between suppliers.” The interviewee explained that the GSA was under new leadership and explained that the new leadership is “setting the new bar or resetting the new baseline as to where they want to take their business and how commodities and services will play a role in that.”

The interviewee was aware of current legislation involving transformation of federal purchasing, to include the (then-proposed) “Amazon Amendment.” The interviewee stated, “GSA has been performing their own study and analysis of (the) government marketplace.” The interviewee explained that the GSA has been going through system consolidation and streamlining its processes. The interviewee stated that several modernization tracks for *GSA Advantage* have been created. The modernization effort includes tracks such as “sign on, registration, user management, and the shopping cart experience, and all the capabilities around that.”

The interviewee also explained that *GSA Advantage* was just one of many systems managed by the Federal Acquisition Service organization. The interviewee stated, “GSA provides a vast array of offerings and many diverse methods and technologies for acquiring these offerings, passing the savings, knowledge, and compliance onto all of government.” The interviewee spoke highly of GSA eBuy, which is another system of capabilities under the *GSA Advantage* umbrella. eBuy draws in about \$11 billion in awards each year. It allows users to build Requests for Quotes and Requests for Proposals, and connects with the vendors who hold GSA contracts.



Shadow of E-Commerce

Currently, the GSA is facing challenges in the shadow of e-commerce. The interviewee stated, “We are not private industry. We will never be Amazon.” The interviewee emphasized that the GSA was a government organization. The interviewee said,

GSA’s purpose is to provide as much current information on catalogs and contracts to assist consumers and suppliers to do market research, not just for price comparison, but also to identify and support socioeconomic programs, environmentally friendly products, and mandatory or preferred sources of supply for the government.

The interviewee stated, “The biggest issues and challenges with meeting and exceeding customer expectations would be policy and compliance within the government and existing terms and conditions in the contracts.” The rules and regulations that the GSA is bound to creates an atmosphere where the GSA is unable to provide the level of customer service available on commercial platforms. The interviewee said, “For example, *Advantage* cannot provide vendor ratings, and is very limited as to what products can be promoted on the site. The system follows the terms and conditions stated in the contract, which limits capabilities for upselling, and influencing a purchase.” The GSA believes vendor ratings promote one vendor over the other, which is not allowed due to government policy and rules and regulations. The interviewee did say that they would love for the company to provide vendor ratings in the future.

Small Business Goals

The GSA has aggressive small business goals and assists ordering activities in achieving or exceeding their goals. The interviewee stated that within the GSA, “Approximately 80 percent of all GSA contractors are small businesses.” The interviewee explained that all socioeconomic items and services are identified on the site in a way that is clearly visible to buyers, and all transactions are captured.

Minimum Order Requirements

While the interviewee explained that *GSA Advantage* was geared “towards the smaller commodity buys,” GPC holders have voiced concerns regarding minimum order requirements. The interviewee agreed the search results within *GSA Advantage* are skewed because of the minimum order requirements—minimum order requirements are not taken into account when displaying what appears to be the lowest priced item. The interviewee agreed that disparity makes it difficult to accurately compare prices.

The interviewee stated that *GSA Advantage* is currently developing a prototype to make the user interface filter search results and incorporate minimum order requirements into the displayed filtered search results. The interviewee also emphasized that all the minimum order requirements and price discounts are per the terms and conditions of the contract previously established under the MAS program. The interviewee said, “*Advantage* shows what a vendor provides based on the terms and conditions of their contract.” The interviewee explained that to achieve a lower price per unit, the vendors claim that they must have a minimum dollar amount to break even. However, the interviewee stated that you could find the items at a lower cost per unit on websites like Amazon. The interviewee stated in the future, vendors should provide the government with wholesale prices, which would provide lower prices.



Level Three Data/Transactional Level Data

Level three data and transactional level data, which require the capture of specific line item data (e.g., merchant name, address, invoice number, and other line item details), are necessary for agencies to accurately understand and assess their GPC transactions. The interviewee stated that the GSA captures everything and produces an analytics report. When asked if *GSA Advantage* required participating vendors to provide level three data, the interviewee stated, “Yes, all of this data comes in during contract or catalog submission. It is then matched when items are purchased on the site, so all level three transactional data is captured.”

While the GSA provides level three data, vendors are not required to provide transactional level data; these vendors frequently claim it is too expensive. However, we learned that the catalog data is not linked to vendor data, so it does not provide the complete picture of each transaction.

Survey

The survey began by collecting sample data. The 428 GPC holder respondents were nearly evenly split on gender, with 57% responding male and 41% responding female (2% declined to answer). Of the total, 35% were in the 51–60 age group, 21% were in the 41–50 age group, 19% were in the 31–40 age group, 12% were in the 18–30 age group, and 13% over 61 years of age. We also collected data on grade (rank) of the respondents. Thirty-five percent of the respondents were civilian employees in the grade of GS-7 to GS-9; 20% were civilian GS-12 to GS-13; 20% were civilian GS-10 to GS-11; 11% were military E-5 to E6; 6% were military E-7 to E-9; 3% were military E-1 to E-4; 3% were military O-1 to O-3; 1% was O-4 to O-6; and 1% was GS 14+. Regarding experience in the GPC program, 46% of the respondents had over five years of experience, 20% had one to two years of experience, 18% had three to five years of experience, and 16% had less than one year of experience.

GSA Advantage

The survey asked cardholders about their experience with the two platforms. Of the 91% of respondents who had used a GPC to purchase from *GSA Advantage*, 42% had purchased from *GSA Advantage* more than 10 times, 31% had purchased from *GSA Advantage* two to five times, 21% had purchased from *GSA Advantage* six to 10 times, and 6% had only purchased from *GSA Advantage* once. Compared to other online ordering platforms, 46% of respondents said that *GSA Advantage*'s website was more difficult to use, 44% said it was similar to use, and 10% said it was easier to use. Regarding search, 48% of respondents said that *GSA Advantage*'s search engine results page was less comprehensive than other online ordering websites, while 44% said it was similar, and 8% said it was more comprehensive. A majority (54%) of respondents stated that *GSA Advantage*'s shipping policies were similar to other online ordering websites. When asked about return policies, 26% of respondents stated that *GSA Advantage*'s return policies were similar to other online ordering websites; however, 58% had never attempted to return a product purchased through *GSA Advantage*. Regarding pricing, 51% of respondents stated that *GSA Advantage* was more expensive than other online ordering websites, 39% said prices were similar, and 10% said *GSA Advantage* was less expensive. Forty-six percent stated that finding the lowest price on *GSA Advantage* was similar to other online ordering websites, 41% stated that finding the lowest price was more difficult, and 13% said that it was easier. A majority (62%) of respondents never sought additional discounts or rebates when purchasing from *GSA Advantage*. However, when respondents asked for a discount, 72% stated they “sometimes” receive it, 16% said they “never” receive it, and 12% said they received it “most of the time.” Finally, when asked to rate their level of customer satisfaction with *GSA Advantage*, the participants' ratings varied widely between very dissatisfied and



somewhat satisfied; 28% of the respondents were somewhat satisfied, 25% were neither satisfied nor dissatisfied, 21% were somewhat dissatisfied, 13% were very satisfied, and 13% were very dissatisfied.

Amazon Business

Of the 428 respondents, only 77 (18%) had conducted a GPC transaction on *Amazon Business*. Of those that had placed a purchase using the platform, 45% had purchased from *Amazon Business* two to five times, 26% had purchased more than 10 times, 20% had purchased six to 10 times, and 9% had purchased only once. Compared to other online ordering platforms, 68% of respondents said that *Amazon Business's* website was easier to use, 30% said it was similar to use, and 2% said it was more difficult. Regarding search, 58% of respondents said that *Amazon Business's* search engine results page was more comprehensive than other online ordering websites, 37% said it was similar, and 5% said it was less comprehensive. A majority of respondents (57%) said *Amazon Business's* shipping policies were better, while 41% said they were similar, and 2% said they were worse. *Amazon Business's* return policies were rated as better than other online ordering websites by 34% of respondents, 21% said they were similar, and 5% said they were worse; however, a full 40% had not completed a return. No respondents felt that *Amazon Business's* prices were higher than other online marketplaces; 55% of respondents stated that, in their experience, *Amazon Business* was less expensive, while 42% said the platform's prices were similar to those offered on other online platforms. A majority of respondents (57%) stated that finding the lowest price on *Amazon Business* was easier than it was on other online ordering websites, while 42% stated that it was similar to other online ordering websites, and 1% said it was more difficult. When asked if they sought additional discounts or rebates from vendors on *Amazon Business*, 76% of respondents responded that they had never sought additional discounts or rebates when placing purchases on the platform, 14% responded they had sometimes asked for an additional discount, 6% responded that they often ask for a discount, and 4% responded that they always ask for a discount. However, when respondents asked for a discount, 57% stated they "sometimes" receive it, 27% said they receive it "most of the time," and 16% said they "never" receive it. Finally, when asked to rate their level of customer satisfaction with *Amazon Business*, 61% of respondents were very satisfied, 20% said somewhat satisfied, 15% were neither satisfied nor dissatisfied, 2% were somewhat dissatisfied, and 2% were very dissatisfied.

Amazon.com

While industrial purchasing differs in several ways from personal shopping, we asked respondents to provide information on their personal interactions with Amazon.com's retail platform (Amazon) as these personal experiences may frame expectations and preferences in a professional context. The vast majority of respondents (394 respondents; 92%) had purchased from Amazon in a personal capacity. Of these, 58% had purchased from Amazon more than 10 times, 22% purchased two to five times, 16% purchased six to 10 times, and 4% had purchased only once. Compared to other online ordering platforms, 70% of respondents said that Amazon was easier to use, 29% said it was similar to use, and 1% said it was more difficult to use. Regarding search, 60% of respondents said that Amazon's search engine results page was more comprehensive than other online ordering websites, 36% said it was similar, and 4% said it was less comprehensive. A majority (64%) of 394 respondents who had purchased from Amazon stated that shipping policies were better than other online ordering websites, while 35% said policies were similar, and 1% said policies were worse. We also asked about experiences with returning products to Amazon; 51% stated that Amazon's policies for returns were better than other online ordering websites, while 23% said policies were similar, 2% said policies were worse, and 24% had never



returned a product purchased from Amazon. When asked about product pricing, 64% of respondents stated that prices on Amazon were lower than other online ordering websites, while 35% responded that prices were similar, and 1% responded that prices on Amazon were more expensive than comparable sites. Regarding ease of locating lowest prices for products, 60% of respondents stated that finding the lowest price on Amazon was easier than other online ordering websites, 37% stated that it was similar to other online ordering websites, and 3% said it was more difficult. We also asked about propensity to seek discounts; 67% of respondents never sought additional discounts or rebates when purchasing from Amazon, 22% sometimes sought additional discounts, 6% always sought additional discounts, and 5% often sought additional discounts. However, when respondents asked for a discount, 70% stated they “sometimes” receive it, 23% receive the discount “most of the time,” and 7% “never” receive it. Finally, when asked to rate their level of customer satisfaction with Amazon, a majority (66%) of respondents were very satisfied, 23% were somewhat satisfied, 8% were neither satisfied nor dissatisfied, and 2% were very dissatisfied.

Online Product Reviews

The volume and valence of online customer reviews (i.e., product reviews, vendor ratings) influence buyer expectations and buyer preferences (Wu et al., 2015) as well as retailer sales (Floyd et al., 2014). In B2B settings, online customer reviews also influence the behavior of industrial purchasers (i.e., within online B2B marketplaces), where purchasers frequently reconcile internally-generated reviews with external review information (Steward, Narus, & Roehm, 2017). However, little is known about how public-sector purchasers view online customer reviews and how they incorporate these reviews into their industrial purchasing decisions. To investigate these issues, we asked respondents a series of questions about (1) online vendor ratings and (2) online product reviews. When asked about online vendor ratings, a majority (84%) of respondents indicated that vendor ratings are important, and within that group, another 84% said they factored these ratings into their purchasing decisions. Respondents also indicated that online product reviews were important. Of the total respondents, 92% stated that product reviews were important to them, and of these, 91% responded that they made purchasing decisions based on product reviews.

Marketplace Preference

We asked respondents if they would prefer to place GPC purchases at *GSA Advantage* or at *Amazon Business*, given the choice. More than three-quarters (78%) of respondents indicated that they would prefer *Amazon Business*. To better understand this result, we examined the effects of influential factors on GPC holders’ online platform preference within a generalized linear model using a logit link function, a logistic regression. Online platform preference was a binary response measured by self-report on a cardholder’s preference to order from Amazon (Amazon.com or *Amazon Business*) instead of *GSA Advantage*, given the opportunity. Thus, we subset our sample to cardholders who are current users of *GSA Advantage*—those who reported placing at least one purchase annually through *GSA Advantage*—and who have experience placing GPC purchases through either Amazon.com or *Amazon Business*. This filtering procedure resulted in a sample of 360 respondents. We are unable to conclude, based on the results of chi-square testing of distributions from cardholder demographics, that respondents from this subset otherwise differ significantly from those in the larger random sample.

Regressors in the model accounted for cardholders’ perceptions of *GSA Advantage*’s price and quality competitiveness. Price competitiveness was based on a comparative price assessment against other online marketplaces. Quality competitiveness captured the



following dimensions of site quality: (1) overall ease of site use; (2) ease of locating lowest item pricing; (3) comprehensiveness of site search and (4) adequacy of logistics (shipping and returns) policies. For all regressors, competitiveness was measured as a comparative assessment of *GSA Advantage* against other online marketplaces. Given Amazon.com’s prominence as an online marketplace and likelihood for cardholders to anchor their comparisons against an Amazon marketplace, we reduce our exposure to multicollinearity by including in our model only competitiveness assessments of *GSA Advantage*. All regressors were measured using single-item, categorical scales.

To control for potential confounding effects, we also included several covariates in the model. These factors included respondent (1) gender, (2) age, (3) years of experience as a cardholder, (4) frequency of *GSA Advantage* use, (5) propensity to request price discounts, and (6) overall customer satisfaction with *GSA Advantage*. Customer satisfaction was assessed on a five-point Likert-type scale and was treated in the model as a continuous variable. Similarly, age intervals were treated as continuous. All other covariates were included in the model as categorical factors.

Model estimation was performed in R (R Core Team, 2017) using maximum likelihood estimation. The model, Model 1, offered improved fit to the data over a null model and correctly predicted the preference for 88.33% of cardholders (32 of 65 who prefer *GSA Advantage* and 286 of 295 who prefer Amazon). In an effort to produce a parsimonious model of cardholder preference, we utilized iterative backward selection (see Table 1) to identify potential factors for exclusion. Factor contribution to model fit was assessed by chi-square change and Akaike Information Criterion (AIC).

Table 1. Single-Term Deletions for the Full and Parsimonious Model

Variable	df	Model 1		Model 2	
		Dev.	LR	Dev.	LR
<i>Null</i>		207.63		223.58	
Cardholder Gender	2	208.42	0.78		
Cardholder Age	1	211.40	3.77 [†]	229.70	6.13*
Cardholder GPC Experience	3	209.71	2.08		
Frequency of GSA Advantage Use	3	211.30	3.67		
Customer Sat. w/ GSA Advantage	1	214.63	7.00**	234.18	10.60**
Website Ease of Use	2	217.64	10.01**	241.15	17.58**
Search Comprehensiveness	2	210.47	2.84		
Shipping Policy Adequacy	2	210.11	2.48		
Returns Policy Adequacy	3	214.75	7.12 [†]	230.41	6.83 [†]
Pricing Competitiveness	2	215.74	8.11*	234.76	11.19**
Ease of Locating Lowest Price	2	210.31	2.68		
Propensity to Seek Discounts	3	208.87	2.24		

Note: ** $p < .01$; * $p < .05$; [†] $p < .10$; AIC = 261.63 (Model 1), 243.58 (Model 2).

Based on these assessments, gender, GPC program experience, the frequency of *GSA Advantage* use, propensity to seek discounts, search comprehensiveness, shipping policy, and ease of locating lowest price were excluded from the model. The removal of these factors did not result in a significant reduction to model fit. The parsimonious model, Model 2, correctly predicted preference for 85% of cardholders (24 of 65 who prefer *GSA Advantage* and 282 of 295 who prefer Amazon). Beta coefficients in the table represent the estimated (conditional) change in log-odds of a cardholder preferring Amazon over *GSA Advantage* when a regressor is changed by one unit. Exponentiated coefficients are presented within the text. Logistic regression results are listed in Table 2.



Table 2. Logistic Regression Results

Variable	OR [§]	β	SE	Pr(> z)
(Intercept)	4.90	1.59	.43	<.01**
Cardholder Age [‡]	.97	-.03	.01	.02*
Customer Sat. w/ GSA Advantage [‡]	.53	-.64	.20	<.01**
<i>Website Ease of Use</i>				
Easier	.22	-1.50	.46	<.01**
Similar	————— <i>Referent Group</i> —————			
More Difficult	2.77	1.02	.53	.05 [†]
<i>Returns Policy Adequacy</i>				
Better	.08	-2.57	1.23	.04*
Not Sure	.83	-.19	.39	.64
Similar	————— <i>Referent Group</i> —————			
Worse	1.50	.40	.69	.56
<i>Pricing Competitiveness</i>				
Less Expensive	.61	-.49	.50	.33
Similar	————— <i>Referent Group</i> —————			
More Expensive	2.89	1.06	.40	<.01**

Note: ** $p < .01$; * $p < .05$; [†] $p < .10$; [‡]mean-centered; [§]OR (Odds Ratio) = e^{β} .

Cardholder Age and Customer Satisfaction

A cardholder’s odds of preferring *Amazon Business* to *GSA Advantage* decrease by 3.41% for each additional year group ($\beta = -.03$, se = .01, $p = .02$). Similarly, a cardholder’s odds of preferring Amazon decrease by 47.32% with each one-unit increase in their self-reported level of satisfaction with *GSA Advantage* ($\beta = -.64$, se = .20, $p < .01$).

Website Ease of Use

For the categorical regressor, *website ease of use*, we selected “similar” as our referent category. When cardholders perceive *GSA Advantage* to be easier to use (comparatively to other online ordering sites), their odds of preferring Amazon to *GSA Advantage* decrease by 77.67% ($\beta = -1.50$, se = .46, $p < .01$). Alternatively, when cardholders perceive *GSA Advantage* to be more difficult to use, their odds of preferring Amazon increase by 177.39%. However, this difference is borderline in statistical significance ($\beta = 1.02$, se = .53, $p = .05$)

Return Policy Adequacy

For *return policy adequacy*, we again selected “similar” as our referent category. Cardholder odds of preferring Amazon over *GSA Advantage* only differ (from the referent category) for those cardholders who perceive *GSA Advantage*’s return policies to be better in comparison to policies of other online order sites. For these cardholders, the odds of preferring Amazon decrease by 92.35% ($\beta = -2.57$, se=1.23, $p = .04$).

Price Competitiveness

For *price competitiveness*, we again used “similar” as our referent category. Our data does not suggest that cardholders who view *GSA Advantage*’s pricing as being less expensive (in comparison to other online ordering sites) are more or less likely to prefer Amazon to *GSA Advantage* ($\beta = -0.49$, se = .50, $p = .33$) than cardholders who feel that *GSA Advantage*’s pricing is similar to other online ordering sites. However, when cardholders view *GSA Advantage*’s pricing as being more expensive, their odds of preferring Amazon increase by 188.64% ($\beta = 1.06$, se = .40, $p < .01$).



Between-Marketplace Price Comparison

We found that, of the vendors that offered the 60 compared items, prices on *GSA Advantage* were lower than *Amazon Business* 80% of the time (241 times out of 300). However, every *GSA Advantage* item had a minimum order requirement. In contrast, *Amazon Business* did not have a minimum order requirement for any of the items that we examined. The tables in this section show different observations about the data. For each observation, we display a subset of the 60 items that were compared, abbreviating the full results for brevity.

Lowest and Highest Prices

Table 3 compares the prices of the items between each platform. The table highlights which platform offered the lowest price and which platform had the highest price for each item. At times, *GSA Advantage* offered the lowest and highest price for the same item; other times, *Amazon Business* offered the lowest and highest price for the same item.

Table 3. Lowest and Highest Prices

Item	Item Description	Average Price	
		GSA	AB
1	Smead Mead Heavyweight 2-Pocket Portfolio	\$18.30	\$27.56
2	Boise Polaris Premium Multipurpose Paper	\$39.25	\$47.58
3	7510012360059 Document Protector	\$5.32	\$7.33
4	Skilcraft Gregg Ruled Steno Book	\$8.29	\$22.14
5	7530 Notebook, Steno	\$16.49	\$26.81
6	Double Pocket Portfolio, Letter Size, Dk Blue	\$12.42	\$13.56
7	Mechanix Wear MP3-F55-010 TAA Compliant	\$40.27	\$85.63
8	Energizer Industrial Alkaline Batteries, AA	\$3.31	\$11.49
9	Wilson Jones Basic Round-Ring View Binder Plus Pack, 1" Cap, White	\$9.02	\$15.32
10	Skilcraft Dry-Erase Markers	\$6.06	\$10.13
11	G2 Fashion Collection Gel Roller	\$6.14	\$16.50
12	United Stationers (OP) 8105011958730 Bag Clear 10 Gallon	\$9.46	\$29.85
13	Brother P-touch ~3/8" (0.35") Black on White Standard Laminated Tape	\$8.12	\$10.93
14	Saalfeld Redistribution Lysol Surface Disinfectant Cleaner	\$6.64	\$15.96
15	Accelerator-free Disposable Nitrile Glove, Powder Free, Small	\$7.41	\$28.23

Bulk and Quantity Discounts

Table 4 shows a sample of the bulk/quantity discounts offered by each platform. *GSA Advantage* listed quantity discounts by schedule, while individual vendors offered quantity discounts on *Amazon Business*. Of the 60 items, only six *GSA Advantage* schedules offered a quantity discount. On *Amazon Business*, only seven vendors offered quantity discounts. However, while *Amazon Business* offered discounts with lower minimum quantities, *Amazon Business's* prices were still higher than *GSA Advantage's*—even with the discount applied. Both platforms had a quantity discount on item two and item nine, as shown in Table 4.



Table 4. Bulk/Quantity Discounts

Item	Item Description	Quantity Required & Discount			
		GSA		Amazon Business	
1	Smead Mead Heavyweight 2-Pocket Portfolio	-	-	-	-
2	Boise Polaris Premium Multipurpose Paper	3,000 - 4,999 5,000 - 9,999 10,000+	2.00% 3.00% 5.00%	4+	0.98%
3	7510012360059 Document Protector	-	-	-	-
4	Skilcraft Gregg Ruled Steno Book	-	-	-	-
5	7530 Notebook, Steno	-	-	-	-
6	Double Pocket Portfolio, Letter Size, Dk Blue	-	-	-	-
7	Mechanix Wear MP3-F55-010 TAA Compliant	25,000 - 99,999,999	2.00%	-	-
8	Energizer Industrial Alkaline Batteries, AA	-	-	-	-
9	Wilson Jones Basic Round-Ring View Binder Plus Pack, 1" Cap, White	20,001 - 99,999,999	1.00%	4+	0.92%
10	Skilcraft Dry-Erase Markers	-	-	-	-
11	G2 Fashion Collection Gel Roller	-	-	-	-
12	United Stationers (OP) 8105011958730 Bag Clear 10 Gallon	-	-	-	-
13	Brother P-touch ~3/8" (0.35") Black on White Standard Laminated Tape	-	-	-	-
14	Saalfeld Redistribution Lysol Surface Disinfectant Cleaner	-	-	-	-
15	Accelerator-free Disposable Nitrile Glove, Powder Free, Small	-	-	-	-

Shipping

Table 5 displays *Amazon Business's* shipping time and cost, and Table 6 displays *GSA Advantage's* shipping time and cost. On *Amazon Business*, the average shipping time was 9.25 days, and the average shipping cost was \$2.33. For *GSA Advantage*, the average shipping time was 5.45 days, and shipping was free.



Table 5. Amazon Business Shipping

Item	Item Description	Shipping Time (Days)			Shipping Cost
		Min	Max	Avg	Avg
1	Smead Mead Heavyweight 2-Pocket Portfolio	7	14	8.50	\$1.19
2	Boise Polaris Premium Multipurpose Paper	3	14	7.60	\$0.00
3	7510012360059 Document Protector	2	17	6.20	\$1.98
4	Skilcraft Gregg Ruled Steno Book	6	9	7.50	\$8.61
5	7530 Notebook, Steno	2	23	9.10	\$4.02
6	Double Pocket Portfolio, Letter Size, Dk Blue	6	16	8.38	\$4.78
7	Mechanix Wear MP3-F55-010 TAA Compliant	3	14	7.33	\$3.64
8	Energizer Industrial Alkaline Batteries, AA	2	14	7.60	\$0.00
9	Wilson Jones Basic Round-Ring View Binder Plus Pack, 1" Cap, White	5	14	8.90	\$2.09
10	Skilcraft Dry-Erase Markers	5	23	11.50	\$1.50
11	G2 Fashion Collection Gel Roller	5	26	11.60	\$2.16
12	United Stationers (OP) 8105011958730 Bag Clear 10 Gallon	6	14	9.00	\$6.61
13	Brother P-touch ~3/8" (0.35") Black on White Standard Laminated Tape	2	15	6.20	\$0.00
14	Saalfeld Redistribution Lysol Surface Disinfectant Cleaner	6	12	8.50	\$4.98
15	Accelerator-free Disposable Nitrile Glove, Powder Free, Small	2	14	7.20	\$6.35

Table 6. GSA Advantage Shipping

Item	Item Description	Shipping Time (Days)			Shipping Cost
		Min	Max	Avg	Avg
1	Smead Mead Heavyweight 2-Pocket Portfolio	1	4	2.2	\$0.00
2	Boise Polaris Premium Multipurpose Paper	2	5	3.2	\$0.00
3	7510012360059 Document Protector	2	7	4.2	\$0.00
4	Skilcraft Gregg Ruled Steno Book	1	7	2.8	\$0.00
5	7530 Notebook, Steno	1	7	3.6	\$0.00
6	Double Pocket Portfolio, Letter Size, Dk Blue	3	7	4.4	\$0.00
7	Mechanix Wear MP3-F55-010 TAA Compliant	3	45	14.2	\$0.00
8	Energizer Industrial Alkaline Batteries, AA	1	5	3	\$0.00
9	Wilson Jones Basic Round-Ring View Binder Plus Pack, 1" Cap, White	1	5	2.6	\$0.00
10	Skilcraft Dry-Erase Markers	2	14	5.2	\$0.00
11	G2 Fashion Collection Gel Roller	1	5	2.6	\$0.00
12	United Stationers (OP) 8105011958730 Bag Clear 10 Gallon	3	7	4.8	\$0.00
13	Brother P-touch ~3/8" (0.35") Black on White Standard Laminated Tape	1	4	2	\$0.00
14	Saalfeld Redistribution Lysol Surface Disinfectant Cleaner	2	5	3.6	\$0.00
15	Accelerator-free Disposable Nitrile Glove, Powder Free, Small	3	14	6.8	\$0.00

Small Business Representation

On *GSA Advantage*, every small business category was represented, and of the 60 items we researched, every item was offered by a socioeconomic business. On *Amazon Business*, most of the small business categories were represented. However, only 35%, (21 of the 60 items) were offered by a small business. Table 7 displays small business category representation of our researched items.



Table 7. Small Business Representation

		GSA	AB
s	Small Business	X	X
o	Other than Small Business	X	
w	Woman Owned Business	X	X
wo	Women Owned Small Business (WOSB)	X	X
ew	Economically Disadvantaged Women Owned Small Business (EDWOSB)	X	
v	Veteran Owned Small Business	X	X
mo	Minority Owned		X
dv	Service Disabled Veteran Owned Small Business	X	
d	SBA Certified Small Disadvantaged Business	X	X
8a	SBA Certified 8(a) Firm	X	X
h	SBA Certified HUBZone Firm	X	X

Vendor Ratings

GSA Advantage does not provide vendor ratings. On *Amazon Business*, the average vendor rating was 93% (out of a possible 100%). Table 8 shows the average vendor ratings for 15 of the 60 researched items.

Table 8. Average Vendor Rating

Item	Item Description	Avg Vendor Rating
1	Smead Mead Heavyweight 2-Pocket Portfolio	88.50%
2	Boise Polaris Premium Multipurpose Paper	90.20%
3	7510012360059 Document Protector	94.20%
4	Skilcraft Gregg Ruled Steno Book	95.00%
5	7530 Notebook, Steno	93.20%
6	Double Pocket Portfolio, Letter Size, Dk Blue	87.00%
7	Mechanix Wear MP3-F55-010 TAA Compliant	99.67%
8	Energizer Industrial Alkaline Batteries, AA	97.00%
9	Wilson Jones Basic Round-Ring View Binder Plus Pack, 1" Cap, White	91.20%
10	Skilcraft Dry-Erase Markers	93.50%
11	G2 Fashion Collection Gel Roller	91.60%
12	United Stationers (OP) 8105011958730 Bag Clear 10 Gallon	88.00%
13	Brother P-touch ~3/8" (0.35") Black on White Standard Laminated Tape	97.00%
14	Saalfeld Redistribution Lysol Surface Disinfectant Cleaner	95.00%
15	Accelerator-free Disposable Nitrile Glove, Powder Free, Small	94.00%

Product Origin

On *GSA Advantage*, all the products originated from the United States. However, on *Amazon Business*, some of the products originated from another country, or the origin was unidentified. Table 9 shows a sample of the product origins of five of the 60 researched items on *Amazon Business*.



Table 9. Amazon Business Product Origin

Item	Item Description	Supplier	Product Origin
1	Smead Mead Heavyweight 2-Pocket Portfolio	My Office Innovations MYO	USA
		Blue Cow Office Product	USA
		Shoplet	USA
		ReStockIt	USA
		AMAZON.COM	USA
2	Boise Polaris Premium Multipurpose Paper	Office Depot, Inc.	USA
		My Office Innovations	USA
		Shoplet	USA
		Bison Office	USA
3	7510012360059 Document Protector	Clean It Supply	USA
		Queenkim98	USA
		Bargain Bosses LLC	USA
		L Palms LLP	Unknown
		Acedepot	USA
4	Skilcraft Gregg Ruled Steno Book	GTN Office Basics	USA
		Corgi Lamps	China
5	7530 Notebook, Steno	Brian Delrosario	USA
		My Office Innovations	USA
		Rock Shop Central	USA
		Independence Fulfillment Services	USA
		Alliance (SUPPLY)	USA

Minimum Order Requirements

Amazon Business did not have any stated minimum order requirements, but every item we researched on *GSA Advantage* had a minimum order requirement. The minimum dollar amounts are dictated by the schedules. We codified the lowest minimum order requirement, the highest minimum order requirement, and the average minimum order requirements. Table 10 displays a sample of the minimum order requirements for 15 of the 60 items.



Table 10. GSA Advantage Minimum Order Requirements (MORs)

Item	Item Description	Min	Lowest MOR	Highest MOR	Average MOR
1	Smead Mead Heavyweight 2-Pocket Portfolio	\$50.00	\$50.00	\$100.00	\$80.00
2	Boise Polaris Premium Multipurpose Paper	\$120.00	\$100.00	\$120.00	\$106.00
3	7510012360059 Document Protector	\$100.00	\$50.00	\$100.00	\$80.00
4	Skilcraft Gregg Ruled Steno Book	\$28.75	\$25.00	\$100.00	\$55.75
5	7530 Notebook, Steno	\$28.75	\$25.00	\$28.75	\$25.75
6	Double Pocket Portfolio, Letter Size, Dk Blue	\$100.00	\$50.00	\$100.00	\$80.00
7	Mechanix Wear MP3-F55-010 TAA Compliant	N/A	\$1.00	\$25.00	\$19.00
8	Energizer Industrial Alkaline Batteries, AA	\$50.00	\$25.00	\$100.00	\$65.00
9	Wilson Jones Basic Round-Ring View Binder Plus Pack, 1" Cap, White	\$100.00	\$50.00	\$100.00	\$80.00
10	Skilcraft Dry-Erase Markers	\$50.00	\$25.00	\$100.00	\$55.00
11	G2 Fashion Collection Gel Roller	\$50.00	\$50.00	\$100.00	\$85.00
12	United Stationers (OP) 8105011958730 Bag Clear 10 Gallon	\$100.00	\$1.00	\$100.00	\$80.20
13	Brother P-touch ~3/8" (0.35") Black on White Standard Laminated Tape	\$50.00	\$30.00	\$100.00	\$66.00
14	Saalfeld Redistribution Lysol Surface Disinfectant Cleaner	\$100.00	\$25.00	\$100.00	\$70.00
15	Accelerator-free Disposable Nitrile Glove, Powder Free, Small	\$1.00	\$1.00	\$100.00	\$35.20

Discussion

Our findings highlight the challenges of implementing an online marketplace for federal and defense requirements, where platforms must address the unique requirements of public-sector purchasing (e.g., socioeconomic representations, exclusions for suspended and debarred suppliers, and country-of-origin mandates such as the Buy American Act, Berry Amendment, and Trade Agreements Act). Our qualitative and quantitative results suggest a need to modernize *GSA Advantage* for improved ease of use and to maintain technological footing with private-sector marketplaces.

Do government regulations limit GPC holder's ability to use commercial e-commerce sources?

The Department of Defense GPC Guidebook and FAR do not limit the ability of GPC holders to utilize private-sector online marketplaces. However, before making a purchase, cardholders must screen for and use mandatory sources of supply (FAR Part 8). If the requirement cannot be met by a mandatory source, the cardholder must consider the use of non-mandatory sources of supply (FAR 8.004). If the mandatory sources listed in FAR 8.002 and 8.003 do not meet the need of a cardholder's requirement, users are encouraged to consider the use of non-mandatory sources of FAR 8.004(a)(1) prior to utilizing commercial sources. We were unable to locate a statute or, for the Air Force, a regulation indicating that the cardholders could not go to *Amazon Business* as a first non-mandatory source. In sections A.4.5 and A.1.2.2, the GPC Guidebook specifically references *GSA Advantage* as an available, non-mandatory, but prioritized government source (DoD, 2015). While the GPC Guidebook cites *GSA Advantage* as an available source, the Guidebook does not cite any available commercial sources. To give users additional buying options, we recommend the Defense Procurement and Acquisition Policy explore adding *Amazon Business* (and similar private-sector marketplaces such as Walmart.com) as examples of available, non-mandatory commercial sources within Guidebook Section A.1.2.2. However, additional research should first be conducted to understand if incorporating a private-sector



marketplace into the Guidebook would violate the Competition in Contracting Act, unfairly favoring *Amazon Business* over other commercially-available platforms that are not included.

How do government purchasing agents view these marketplaces in relation to GSA Advantage?

Based on the GPC survey data, 78% of users would choose *Amazon Business* or Amazon.com over *GSA Advantage*. Further research should explore why users prefer one online ordering platform over another. We found certain factors, such as age, affect a user's preference, but we did not explore why. Using our survey, we found the online ordering platforms ranked in the following order: Amazon.com, *Amazon Business*, and *GSA Advantage*. A majority (70%) of respondents said that Amazon.com was easier to use, and 68% of respondents said that *Amazon Business's* website was easier to use.

From our results, we infer that users preferred Amazon's platforms for several reasons. First, the platform is used widely in the commercial sector, and many people use Amazon in their personal lives. The platform provides a vast selection of supplies, product ratings, and vendor ratings while also offering two-day delivery for most items. We also found that older respondents were less likely to prefer Amazon.com or *Amazon Business*, compared to their younger counterparts. This is likely because older respondents are more familiar with *GSA Advantage*; they have used or have been exposed to the platform for many years in their work life. It is possible that older respondents may also be less likely to use Amazon.com in their personal lives, compared to younger respondents. Our results also suggest that if users were satisfied with *GSA Advantage*, their odds of preferring Amazon decrease by 47%. This shows that once users become comfortable with a platform, they have a hard time accepting or preferring a new platform. However, our results also show if users are dissatisfied with *GSA Advantage*, their odds of preferring Amazon increased by 177%. This means that it is much easier to change behavior if a user is dissatisfied with their current platform.

Because most cardholders prefer Amazon's platforms, *GSA Advantage* and Amazon could partner by putting federally-negotiated schedules on *Amazon Business's* platform. Government purchasers would benefit from the advantages of Amazon's platform (e.g., product and price search, reviews), while maintaining the continuity, security, and quantity pricing available from *GSA Advantage*. Minimum order requirements will still have to be addressed. However, more research is needed to explore the viability of placing government schedules on a commercial platform.

Are these private-sector online marketplaces positioned to support the unique socioeconomic, environmental, and regulatory requirements of the Department of Defense and other federal agencies?

While using *Amazon Business* for GPC purchases may provide several benefits to the government, *Amazon Business*, in its current state, does not appear to be ready for use on purchases above the micro-purchase threshold. The terms and conditions of the business arrangement must be codified, which should include data collection and distribution to the government, privacy, and security of government transactions. *Amazon Business* also needs to improve catalog characteristics to ensure users can easily identify small business vendors when viewing item details. We found it difficult to identify the socioeconomic characteristics of businesses. FAR 19.502-2 states, "each acquisition of supplies or services exceeding \$3,500, but not over \$150,000 is automatically reserved exclusively for small business concerns and shall be set aside for small business." Further, vendors on *Amazon Business* must clearly label the country of origin for available items. We



found it difficult to identify if a product complied with the Buy American Act (41 U.S.C. §§ 8301–8305), Trade Agreements Act (19 U.S.C. §§ 2501–2581), or other country-of-origin restrictions such as those found in the Berry Amendment (10 U.S.C. § 2533a).

Future Research

Currently, *Amazon Business*'s pilot program is underway at a few test bases across the Air Force. While data from the pilot are not yet available for analysis in this research, we recommend future researchers conduct another GPC survey to analyze GPC users' thoughts and preferences of the *Amazon Business* pilot compared to *GSA Advantage*. We also recommend future researchers compare the transactional level data provided by *Amazon Business* to the data provided by *GSA Advantage*. Future research should also compare a breadth of item categories between platforms, including items above the Simplified Acquisition Threshold. Future research should include an analysis of strictly commercially-available items that are not uniquely offered by *GSA Advantage*. Due to the dataset available for our spend analysis, we compared some AbilityOne and Skilcraft items on *Amazon Business* and *GSA Advantage*. We believe these items were more expensive on *Amazon Business*'s website because most of these items were sold through third-party vendors. We also recommend researchers should explore supply chain integrity on commercial ordering websites, as counterfeit items have been a problem on Amazon.com.

Conclusion

Our research focused on the benefits and limitations of each platform for government purchase cardholders, comparing prices, shipping costs, shipping time, ease of use, and customer satisfaction, while considering future improvement initiatives. Every attempt was made to objectively assess each online marketplace. Government purchasing agents should utilize the platform that allows them to purchase a reliable product from trusted vendors, at the best price, while maximizing the value of their time. When comparing *Amazon Business* to *GSA Advantage*, we found that each online ordering platform has advantages and disadvantages. *GSA Advantage* offers discounted commodities, strategically sourced contract vehicles, and tailored data for the Air Force; however, the ordering website is not the best source for GPC purchases due to the minimum purchase requirements. While government cardholders preferred Amazon platforms over the GSA, we found *Amazon Business* in its current state does not appear to be ready for use on purchases above the micro-purchase threshold.



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