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## THURSDAY SESSIONS VOLUME II

### **Government Contractors and Sticky SGA Costs**

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# Government Contractors and Sticky SGA Costs<sup>1</sup>

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## Abstract

Federal contractors must deal with an exceptional amount of paperwork and bureaucracy relative to firms that deal only with the private sector. I investigate whether federal contractors' costs have different responses to revenue increases and decreases. I start by generating a set of federal focus firms that have a business unit name that incorporates the words *federal*, *military*, and *defense*. These firms have built their organizational structure around federal contracting. Because extra paperwork costs are likely to be part of the Selling, General, and Administrative (SGA) costs, I estimate a model of SGA sticky costs. I find that when revenues increase, federal focus firms have greater increases in SGA costs compared to controls. This increase is consistent with higher fulfillment costs for federal contracts. When revenues decrease, federal focus firms have a much lower decrease in SGA costs compared to controls. Federal focus firms have extremely sticky SGA costs. This stickiness is consistent with federal focus firms having higher fixed costs in their procurement systems.

## Introduction

The Department of Defense (DoD) is currently implementing the Better Buying Power initiative (DoD, n.d.), which focuses on “the implementation of best practices to strengthen the Defense Department’s buying power, improve industry productivity, and provide an affordable, value-added military capability to the Warfighter.” An important plank of this approach is “Eliminate Unproductive Processes and Bureaucracy” (DoD, n.d.).

Government contractors have the normal concerns about costs of production/profit margin. However, they also must deal with an exceptional amount of paperwork relative to non-governmental contracts, and usually must hire specialized staff to generate and maintain the required information (Kovacic, 1992). The additional paperwork and extra staff clearly qualify as potentially unproductive processes and as bureaucracy.

My research examines whether these additional costs are sufficiently large to affect the firm’s financial statements. If these government-specific costs are real and substantial, then they should skew the cost behavior of government contractors relative to private sector firms doing comparable work.

I investigate the effect of these costs on the Income Statement. Income Statements have two major cost categories. The Cost of Goods Sold captures the product cost for units sold and is obtained from matching the cost of products to the units sold. These costs are fairly direct and have comparatively little wiggle room for adjustments. The Selling, General, and Administrative (SGA) costs reflect the marketing, administrative, and general overhead

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costs of the organization. These costs contain many allocations and are the likely place where any additional government contracting costs are going to show up.<sup>2</sup>

My research builds upon prior work that investigates the behavior of SGA costs. A classic paper, Andersen, Banker, & Janakiraman (2003), investigated the behavior of SGA costs when revenue increased versus revenue decreased. They found that SGA costs are sticky in that SGA costs increase more when revenues rise than SGA costs decrease when revenues fall. Potential explanations for the stickiness include the existence of SGA fixed costs (Balakrishnan, Labro, & Soderstrom, 2010), or that managers are reluctant to reduce SGA capacity when they believe that a short run cut in revenues is likely to be reversed in the near future (Andersen et al., 2007; Balakrishnan & Gruca, 2008).

I extend the SGA sticky cost framework to investigate whether firms with significant federal contracting have different SGA responses to revenue increases and/or decreases. If a firm believes that the expertise in federal procurement practice is a core competency, then it will be reluctant to reduce its procurement staff in response to lower revenues. I conjecture that federal focus firms will have much stickier costs than will firms in the private sector.

An important innovation in my paper is the creation of a federal focus sample. Prior work has investigated the behavior of federal contractors by assuming that the firms with the largest dollar sales to the federal government are most affected by federal contracts (Wang & San Miguel, 2012). However, an important problem with this approach is that a very large firm like Proctor and Gamble may be one of the most important sellers to the federal government, but the federal sales may be a small percentage of Proctor and Gamble's total sales. In addition, Proctor and Gamble may supply generic products such as toothpaste which do not require satisfying unique federal requirements (and related paperwork). For these reasons, it may not be correct to say that Proctor and Gamble is a federal focus firm.

My federal focus sample is created in a different fashion. I use Compustat's Segment database to identify firms that have a business segment which contain the words federal, government, or military. These federal focus companies believe that federal business is so important that they have built their organization structure on this business. Their organization structure signals that they have a federal focus. While there is some overlap between my list of federal focus companies and the list of firms with the greatest sales to the federal government, roughly two thirds of my federal focus firms are not on the list of the largest 500 federal dollar contractors.

Once I generate the federal focus sample, I estimate an SGA sticky cost regression where I include interaction terms for federal focus firms. The results show that the control firms have mild SGA cost stickiness. Raising revenue by 1% leads to a 0.69% rise in SGA costs, while lowering revenues by 1% leads to a 0.63% decline in SGA costs. The main analysis compares the federal focus firms to the controls. There are significant differences for federal focus firms. Raising revenues by 1% leads to a 0.83% rise in SGA costs, a 20% increase over the control firms. Federal focus firms have higher ramp up in SGA costs, possibly due to increased paperwork for fulfilling government orders. In the same vein,

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<sup>2</sup> While the government has explicit rules about how these costs are presented in their forms, the published financial statements follow financial accounting rules known as the Generally Accepted Accounting Principles.



lowering revenues by 1% leads to a 0.45% drop in SGA costs, a 29% smaller drop than the controls. SGA costs for federal focus companies are much stickier than for the control firms. This increased stickiness could be due to a reluctance to fire highly trained procurement staff or, alternatively, much higher fixed SGA costs.

Robustness tests suggest that my results are knife edge. Changing the time period or the control group leads to insignificant results.

The remainder of the paper is organized as follows: The second section discusses prior research, followed by a presentation of the sticky cost model. The sample is then created and descriptive statistics are calculated. Estimation results follow, and the final section contains the conclusion.

## Literature Review

There has been a fair amount of prior work that has used published financial statements to examine various features of acquisition and contracting. Arnold, McNicol, and Fasana (2009) investigated the impact of various contract forms on contract performance. Berteau, Levy, Ben-Ari, and Moore (2011) used financial statements to analyze the ability of government contractors to obtain capital throughout defense booms and busts. Wang and San Miguel (2012) investigated whether government contractors are obtaining excessive profits. My work complements those prior works by providing an analysis of costs, an important component in determining both performance and profits.

My work investigates the total cost numbers for the organization. The reason is straightforward. Prior work has shown that firms have the incentives and capability to shift costs from the private sector to the government sector (McGowan & Venzryk, 2002; Rogerson, 1992). Cost shifting between the firm's private and public units generates canceling positive and negative entries when the total firm costs are calculated.

Balakrishnan and Gruca (2008) examined sticky costs at the department level in hospitals. They found that in downturns, hospital administrators are reluctant to trim costs and capacity in core activities directly related to patient care. Administrators first adjust costs and capacity in peripheral areas. This research suggests that in a downturn, firms with a federal focus may wish to maintain critical government contract-related processes.

## The Sticky Cost Model

Andersen, Banker, and Janakiraman (ABJ; 2003) performed the seminal analysis of SGA cost stickiness. Their model discriminated between periods when revenues increase and those when revenues decrease. Costs are sticky when the costs have a greater rise when revenues increase than costs fall when revenues decrease.

Equation 1 provides their basic sticky cost model specification,<sup>3</sup>

$$\log\left(\frac{SGA_{i,t}}{SGA_{i,t-1}}\right) = \alpha_0 + \alpha_1 \log\left(\frac{Revenue_{i,t}}{Revenue_{i,t-1}}\right) + \alpha_2 DecrDum_{i,t} * \log\left(\frac{Revenue_{i,t}}{Revenue_{i,t-1}}\right) + \varepsilon_{i,t}, \quad (1)$$

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<sup>3</sup> The ABJ model allows for a cross-section analysis across a wide range of industries, with large differences in the size of firm. Prior work (Davidson & MacKinnon, 1981) rejected a linear form in favor of the log-log specification.



where *DecrDum* is one for firm *i* when sales revenues fall from period *t-1* to *t* and is zero otherwise. If SGA costs are sticky, then the coefficient  $\alpha_2$  should be negative and significant.

I extend Equation 1 to investigate whether federal focus firms have different SGA stickiness than control firms. I create a set of interaction variables which separate out the incremental effect of federal focus firms. Specifically, I use a dummy variable *FSeg*, which is one if the firm has a separate government/federal/military segment and is zero otherwise. My SGA Sticky Cost model is presented in Equation 2:<sup>4</sup>

$$\begin{aligned} \log\left(\frac{SGA_{i,t}}{SGA_{i,t-1}}\right) = & \alpha_0 + \alpha_1 \log\left(\frac{Revenue_{i,t}}{Revenue_{i,t-1}}\right) + \alpha_2 DecrDum_{i,t} * \log\left(\frac{Revenue_{i,t}}{Revenue_{i,t-1}}\right) \\ & + \alpha_3 FSeg + \alpha_4 FSeg * \log\left(\frac{Revenue_{i,t}}{Revenue_{i,t-1}}\right) \\ & + \alpha_5 FSeg * DecrDum_{i,t} * \log\left(\frac{Revenue_{i,t}}{Revenue_{i,t-1}}\right) + \delta_{i,t}. \end{aligned} \quad (2)$$

While I believe that federal focus firms will have different SGA responses than the control firms, the direction of these changes is not obvious. If federal focus firms respond differently to revenue increases, then coefficient  $\alpha_4$  should be significant. If it is significantly positive (negative), then SGA costs have greater increases (decreases) than the controls. If federal focus firms respond differently to revenue decreases, then the expression  $(\alpha_4 + \alpha_5)$  should be significant. If the sum is significantly positive (negative), then federal focus firms have less (more) sticky SGA costs than the controls.

Now that I have presented the model, I turn to the data.

## Sample Creation and Descriptive Statistics

My sample was created in two steps. I first obtained a set of federal focus firms, then generated control firms for these companies.

### **Federal Focus Firms**

The critical element in my research is identifying companies with a federal focus. Prior research (Wang & San Miguel, 2012) has examined the behavior of companies with the greatest dollar value contracts with the federal government. One problem with this approach is that a large dollar value may not reflect a federal focus. For instance, Proctor and Gamble has significant sales to the government, but its sales tend to be for off-the-shelf items such as toothpaste. Proctor and Gamble may not need to deal with issues involving government-specific specifications and may have minimal incremental paperwork requirements. Because of these issues, I use a different approach to identify federal focus firms.

Financial accounting standards require publicly traded firms to separately report information about major business segments. Segment reporting is intended to give

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<sup>4</sup> The variable *Decrdum* is defined in the text. The data for the other variables is drawn from Compustat, Fundamental Annual. Revenue is the Compustat variable sale, while SGA is the Compustat variable xsga.



information to investors and creditors regarding the financial results and position of the most important operating units of a company.<sup>5</sup> Firms that report a federal segment have identified themselves as having a significant line of business related to the federal government.

Table 1, Panel A describes how I generated my list of federal focus firms. I began with all observations on the Compustat Segment database which lists all reported segments for all publicly traded companies in the United States. The Compustat Annual Updates–Segment database is comparatively new and only has data for the last four years, 2010–2013. I searched the database for segment names that contained the term “Defense,” “Military,” “Federal,” “Government,” or “Govt.” This search process identified 39 unique parent companies. Each of these companies believes that their Federal/Government/Military segment is sufficiently different and important to warrant separate presentation in their financial statements.

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<sup>5</sup> Accounting Tools, <http://www.accountingtools.com/questions-and-answers/what-is-segment-reporting.html>, provides an excellent description of segment reporting on its website:

Under Generally Accepted Accounting Principles (GAAP), an operating segment engages in business activities from which it may earn revenues and incur expenses, has discrete financial information available, and whose results are regularly reviewed by the entity’s chief operating decision maker for performance assessment and resource allocation decisions. Follow these rules to determine which segments need to be reported:

- Aggregate the results of two or more segments if they have similar products, services, processes, customers, distribution methods, and regulatory environments.
- Report a segment if it has at least 10% of the revenues, 10% of the profit or loss, or 10% of the combined assets of the entity.



**Table 1. The Sample Creation**

**Panel A. Federal Focus Firms**

Active and Inactive Observations From Compustat Annual Updates—Segments (Non-historical) 2010–2013	166,898
Parent Firms with Federal, Government, or Military Segment	39
Observations for Federal focus from Compustat, Fundamental Annual, 1993–2012	517
Less:	
Outliers	473
Influential Observations	<u>269</u>
Total Observations	269
Number of Unique Companies	35

**Panel B. Control Firms**

Active and Inactive Observations From Compustat, Fundamental Annual 1993–2012	211,513
Less observations excluded because they are:	
Foreign Companies	191,744
Missing or Infeasible data	89,214
Sales decr and SGA/COGS incr, or SGA > Sales	80,096
Not in Fed Focus Industry or Year	49,741
Outliers	43,103
Influential Observations	<u>39,539</u>
Total Observations	39,539
Number of Unique Companies	6,991





I used the parent company identification to draw data from Compustat, Fundamental Annual for the years 1993–2012.<sup>6</sup> At this stage, there were 517 observations. Later analysis trimmed outliers and removed influential observations. The final list of federal focus firms contains 269 observations for 35 unique companies.

My list of 35 federal focus firms and their associated industry, their Naics Sector, is provided in Table 2. While the majority of the firms are in manufacturing industries, there is a wide divergence of other industries represented, from construction to educational services.

**Table 2. Federal Focus Companies by Naics Sector**

CONSTRUCTION- 23	WHOLESALE TRADE - 42
FLUOR CORP*	AAR CORP*
KBR INC	NASH FINCH CO
MANUFACTURING - 32, 33	INFORMATION - 51
USEC INC	SAPIENT CORP
ALLIANT TECHSYSTEMS INC*	FINANCE AND INSURANCE - 52
ANAREN INC	HEALTH NET INC*
BOEING CO*	PROFESSIONAL, SCIENTIFIC AND TECHNICAL - 54
CUBIC CORP	BAKER (MICHAEL) CORP*
EMS TECHNOLOGIES INC	CH2M HILL COS LTD
FEDERAL SIGNAL CORP	INTEGRAL SYSTEMS INC*
FLIR SYSTEMS INC	SAIC INC
GENCORP INC	URS CORP*
HARRIS CORP*	ADMINISTRATIVE AND SUPPORT - 56
II-VI INC	ENERGYSOLUTIONS INC
IROBOT CORP	KFORCE INC
ITT CORP*	EDUCATIONAL SERVICES - 61
MOOG INC -CL A	GP STRATEGIES CORP
NATIONAL PRESTO INDS INC	
RAYTHEON CO*	
SPARTON CORP	
SYMMETRICOM INC	
TEL-INSTRUMENT ELECTRONICS	
TELEDYNE TECHNOLOGIES INC*	
TRIMAS CORP	

\* A top 500 recipient of defense contracts for 2008.

As was mentioned previously, my approach to identifying firms with a federal focus differs from prior work. For instance, Wang and San Miguel (2012) used Fedspending.org to identify 112 publicly traded companies in the 500 companies with the largest dollar values of defense contracts awarded in 2008. Comparing their list to Table 2 shows that there are 12

<sup>6</sup> Following ABJ, I use 20 years of data to estimate my models.



firms in common. Untabulated results show that the 12 common firms are substantially larger than the other 23 firms.<sup>7</sup>

### **Control Sample**

My control sample provides a benchmark to judge the performance of the federal focus firms. Table 1, Panel B provides the details.

The control sample began with the entire set of active and inactive Compustat firms for 1993–2012. I deleted foreign firms. I then removed observations missing data or with infeasible data (e.g., negative revenues). Next, I dropped observations if Sales decreased, but SGA or COGS rose. Following ABJ, I also removed observations if the firm's SGA costs were greater than Revenues. I then deleted all year \* industry observations with no federal focus observation in that year \* industry.

Prior work has consistently found that sticky costs only show up in the estimation results after extensive data cleaning. For instance, ABJ trimmed 1% of all variables and threw out all influential regression observations in order to generate results. My sample contains a later time period than ABJ and includes the Great Recession. It therefore contains many more outliers than ABJ. In order to obtain baseline results with SGA sticky costs, I removed the top and bottom 5% of the  $\log\left(\frac{Revenue_{i,t}}{Revenue_{i,t-1}}\right)$  observations and the top (bottom) 0.5% of the  $DecrDum_{i,t} * \log\left(\frac{Revenue_{i,t}}{Revenue_{i,t-1}}\right)$  observations. Although I trimmed many observations, the range of variation in my retained data is comparable to prior work.

My final data reduction removed all observations that were influential in the SGA Sticky Cost regression.<sup>8</sup> My final set of controls consists of 39,539 observations over 20 years for 6,991 firms in nine industries.

My estimation sample combines the control firms with the federal focus firms. One important observation is that there are comparatively few federal focus (269) to control observations (39,539). A major concern is that the signal from the small number of federal focus observations could be drowned out by the large number of controls. Although this is a valid issue, the regression results generate statistically significant, and intuitive, estimates.

The imbalance between the number of control and federal focus observations may explain the knife-edge nature of my results. The federal focus signal is strong only under a tightly controlled set of data conditions.

### **Descriptive Statistics**

Table 3, Panel A provides the descriptive statistics for my sample. Supplemental information shows that average total assets are comparable for federal focus and control firms (3,972 million versus 3,892 million), but that on average, federal focus firms have more employees (16,803 versus 5,556). In addition, federal focus firms have higher revenues, higher SGA expense, and greater COGS. These disparities are excellent reasons why equations use ratios to control for scale effects.

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<sup>7</sup> The 12 firms on both lists have average assets (sales) of 7,786 (8,927), while the 23 other firms in my sample have average assets (sales) of 995 (1,434)

<sup>8</sup> Deleting observations for each regression separately generates qualitatively identical results.



Table 3, Panel B runs the Wilcoxon non-parametric test for differences between variables in the control and federal focus sub-samples. The tests fail to reject that the dependent variable,  $\log\left(\frac{SGA_{i,t}}{SGA_{i,t-1}}\right)$ , and one of the independent variables,  $\log\left(\frac{Revenue_{i,t}}{Revenue_{i,t-1}}\right)$ , are drawn from the same distribution. However, the interaction term,  $DecrDum_{i,t} * \log\left(\frac{Revenue_{i,t}}{Revenue_{i,t-1}}\right)$ , does show a significant difference between federal focus and control observations. This difference has two sources. First, federal focus firms have fewer revenue decreases than controls (11.9% versus 19.5%). Second, untabulated results show that, conditional on revenues falling, the federal focus firms have a smaller reduction in the log revenue ratio (-0.0787 versus -0.190). When revenues fall, federal focus firms are not hit as hard as the control firms.

**Table 3. Descriptive Statistics and Pairwise Tests**

**Panel A. Variables**

Variable	Combined N = 39,808		Federal Focus N = 269		Controls N = 39,539	
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
<b>Supplemental Information</b>						
Total Assets <sup>1</sup>	3,892.2	35,221	3,971.5	9,867.4	3,891.7	35,332
Number Employees <sup>2</sup>	5.6322	21.460	16.803	30.914	5.5563	21.362
<b>Components</b>						
SGA <sup>1</sup>	332.09	1,484.2	508.75	1,029.5	330.89	1,486.7
COGS <sup>1</sup>	1,142.9	6,858.1	3,799.6	8,217.0	1,124.8	6,844.6
Revenue <sup>1</sup>	1,794.1	9,296.1	4,749.2	10,175	1,773.9	9,286.8
Decrdum	0.1948	0.3961	0.1190	0.3243	0.1953	0.3964
<b>Dependent Variable</b>						
Log(SGA <sub>i,t</sub> /SGA <sub>i,t-1</sub> )	0.0753	0.1814	0.0685	0.0860	0.0754	0.1819
<b>Independent Variables</b>						
Log(Revenue <sub>i,t</sub> /Revenue <sub>i,t-1</sub> )	0.1014	0.2064	0.0897	0.0950	0.1015	0.2069
Decrdum *	-0.0369	0.1036	-0.0009	0.0349	-0.0371	0.1039
Log(Revenue <sub>i,t</sub> /Revenue <sub>i,t-1</sub> )						
FSeg	0.0067	0.0819	1	-	0	-

**Panel B. Pairwise Tests for Dependent and Independent Variables**

Variable	Federal Focus	Controls	F Value	Pr. > F
<b>Dependent Variable</b>				
Log(SGA <sub>i,t</sub> /SGA <sub>i,t-1</sub> )	0.0685	0.0754	0.3793	0.5380
<b>Independent Variables</b>				
Log(Revenue <sub>i,t</sub> /Revenue <sub>i,t-1</sub> )	0.0897	0.1015	0.8674	0.3517
Decrdum *				
Log(Revenue <sub>i,t</sub> /Revenue <sub>i,t-1</sub> )	-0.0009	-0.0371	19.124***	< 0.0001

<sup>1</sup> Millions

<sup>2</sup> Thousands

Now that I have described the data, I turn to the regression analysis.



## Estimation Results

Table 4 contains the estimation results for the Selling, General, and Administrative (SGA) Sticky Cost model.<sup>9</sup> The model uses a log-log specification, which means that all coefficients (except the constants) generate an elasticity.

**Table 4. Sticky Cost Regression, Dependent Variable  $\log[\text{SGA}_t/\text{SGA}_{(t-1)}]$**

Variable	SGA Costs
	Coefficient (p-value)
<i>LRevratio</i>   $a_1$	0.6922*** (0.000)
<i>Decr*LRevratio</i>   $a_2$	-0.0628*** (0.000)
<i>FSeg</i>   $a_3$	-0.0113** (0.029)
<i>FSeg*LRevratio</i>   $a_4$	0.1360*** (0.000)
<i>FSeg* Decr*LRevratio</i>   $a_5$	-0.3186** (0.000)
Adj R <sup>2</sup>	0.5855
N	39,808

My control sample's behavior is captured by coefficients  $a_1$  and  $a_2$ . The control results demonstrate sticky SGA costs, though the costs are less sticky than in older samples.<sup>10</sup> Combining the correct coefficients shows that a 1% increase in the revenue ratio ( $a_1$ ) leads to a 0.692% increase in the control firms' SGA, while a 1% decrease ( $a_1+a_2$ ) leads to a 0.629% decrease in SGA. The SGA costs are 0.063% sticky ( $a_2$ ). I can benchmark the magnitude of these effects by evaluating the elasticity at the mean sample values. When revenues (average 1,794 million) increase/decrease by 1%, they change by 17.94 million. When revenues rise (fall) by 17.94 million, SGA costs (average 332.1 million) increase (fall) by 2.30 (2.09) million. At the median combined sample values, SGA costs stick by 0.21 million, or roughly \$210,000.

<sup>9</sup> The model is estimated with fixed industry effects and uses robust standard errors. The VIF scores show no significant multicollinearity.

<sup>10</sup> Anderson, Banker, and Janakiraman (2003) estimate cost stickiness for 20 years, from 1979 to 1998 for all but the financial services industry. They find (Table 2, Model [I]) a comparable increase in SGA costs when revenues rise (0.5459 versus my 0.6922), but a larger decline when costs fall (-0.1914 to my -0.0628). I conjecture the differences are due to my restriction to a subset of industries as well as the different time periods.



The impact of a federal focus on the SGA costs is identified through the interaction terms. Combining the correct coefficients for federal-focused companies ( $a_1+a_3$ ), when the revenue ratio rises by 1%, the SGA ratio rises by 0.828%, which is 0.136% more than for the controls ( $a_4$ ). When revenues rise, federal focus companies have a  $.136/.692 = 19.7\%$  increase in SGA over the controls. This incremental rise could reflect greater paperwork requirements/fulfillment costs for federal focus firms. Combining the correct coefficients ( $a_1+a_2+a_3+a_4$ ), when revenues fall by 1%, the SGA ratio for federal focus falls by 0.447%, which is 0.182% less than for the controls ( $a_1+a_2$ ). When revenues fall, federal focus companies have a  $.182/.629 = 28.9\%$  smaller decrease in SGA costs than control companies. The slower fall could reflect greater fixed costs for federal focus companies, in particular, greater fixed staff costs in the procurement process.

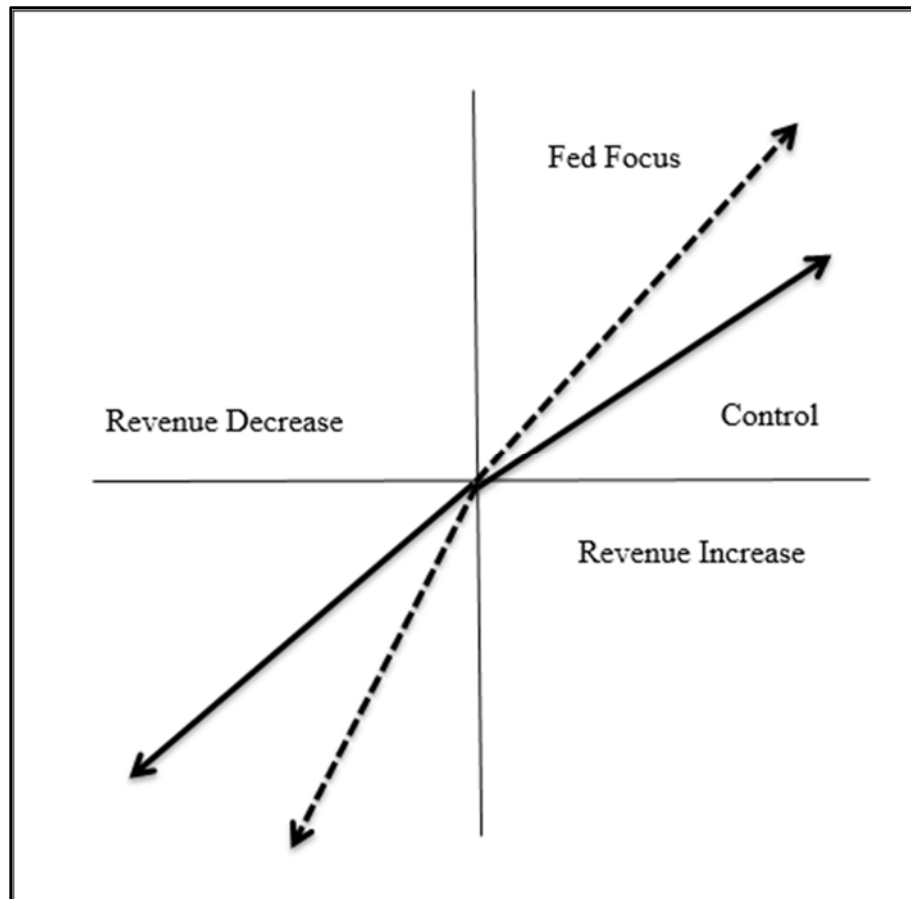
The dollar impact for federal focus companies can be evaluated using the mean sample values. When revenues rise by 1% (17.94 million), SGA costs rise by 2.75 million for federal focus companies versus 2.30 million for the controls—a 0.45 million cost difference. When revenues fall by 1% (17.94 million), SGA costs fall by 1.48 million for federal focus companies, and by 2.09 million for the controls—a 0.61 million cost difference. The dollar value of the federal focus difference is understated since federal focus firms tend to be much larger than the control firms.<sup>11</sup>

Figure 1 illustrates the qualitative behavior of SGA costs for both the controls and the federal focus companies. If a firm is federal focused, then SGA costs rise faster when revenue increases, but fall slower when revenue decreases.

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<sup>11</sup> If the numbers are evaluated at the median federal focus firm value (SGA 508.75), then a 1% revenue increase would cause SGA for controls to rise by 3.522 and federal focus by 4.213, a difference of 0.691 million. A 1% revenue decrease would cause SGA for controls to fall by 3.202 million, and federal focus by 2.273 million, a difference of 0.929 million.





**Figure 1. The Change in the SGA Ratio as a Result of Revenue Increases and Decreases**

### ***Robustness Checks***

My robustness tests suggest that my results are delicate, are knife-edge. Reducing the time period from 20 to 15 (10) years generates qualitatively similar control coefficients, but the federal focus coefficients become insignificant. Alternatively, using the median industry values as controls leads to all coefficients becoming insignificant.

### **Conclusions**

Federal government contractors are qualitatively different than other firms (Kovacic, 1992). Contractors complain about excessive paperwork requirements, fixed margins, and long lead times to obtain contracts. I examine whether these problems are large enough to show up in the published financial accounting data. I use the behavior of SGA costs on firms' published Income Statements to address this issue.

An important innovation in my paper is the creation of a federal focus sample.

I use Compustat's Segment database to identify firms that have a business segment labeled *federal*, *government*, or *military*. These federal focus companies believe that their federal government business is so important that they have built their organization structure around it. While there is some overlap between my list of federal focus companies and the firms with the greatest sales to the federal government, roughly two thirds of my federal

focus firms are not on the list of the largest 500 federal dollar contractors. My sample contains a different, and possibly superior, set of companies than offered by prior work.

Once I generated the federal focus sample, I estimated an SGA sticky cost regression where I included interaction terms for federal focus firms. The results show that the controls have mild SGA cost stickiness. Raising revenue 1% leads to a 0.70% rise in SGA costs, while lowering revenues 1% leads to a 0.63% decline in SGA costs. My main results show that there are significant differences for federal-focused firms. Raising revenues 1% leads to a 0.82% rise in SGA costs, a 20% increase over the controls. When revenues rise, federal-focused firms have a higher ramp up in SGA costs, possibly due to increased paperwork for fulfilling government orders. In the same vein, lowering revenues 1% leads to a 0.45% drop in SGA costs, about 29% below the reduction for the control group. SGA costs for federal focus companies are much stickier than for the controls. The reluctance to reduce SGA costs is consistent with federal focus firms maintaining their core federal procurement process in a downturn.

Robustness tests suggest that my sample is delicate. Changing the time frame or the approach to generating controls leads to no significant results. This delicacy may be due to the small number of federal focus observations relative to control observations.

My paper provides evidence that SGA costs behave differently for government contractors. Balakrishnan, Petersen, and Soderstrom (2004) provided evidence that the magnitude of the change matters. They showed that very large changes in costs lead to greater responsiveness (less stickiness) than smaller changes, and argued that transaction costs will dampen or remove small changes, but not affect larger changes. While similar behavior might hold for federal contractors, I cannot investigate this issue. My sample contains too few observations to analyze this issue.

My analysis looks at the behavior of firms which have a federal focus. However, it does not investigate one other important aspect of government contracting: the form of the contracts. A large body of theoretical literature explores the relationship between optimal contracts and information in procurement (Laffont & Tirole, 1986; Rogerson, 1994). For instance, cost plus contracts may lead to improved risk sharing, but can lead firms to shift costs from commercial to government contracts (Chen & Gunny, 2014; Rogerson, 1992). In contrast, fixed price contracts provide no incentives to shift costs, but may lead firms to underinvest in fixed assets to support the contract. My SGA sticky cost results are consistent with the cost shifting of cost plus contract, but I have no information as to the actual contract form. Future work could connect the contract form with my analysis.

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