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Do Corporate Officers' Political Connections affect Dod Contractor Profitability? A 10-Year, Data-Driven Analysis of U.S. Public Firms

June 2020

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Prepared for the Naval Postgraduate School, Monterey, CA 93943.

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NAVAL POSTGRADUATE SCHOOL

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ABSTRACT

This project uses a disciplined, data-driven approach to analyze the effect that political connection has on possible excessive profits of Department of Defense (DOD) contractors. Such connections could influence government acquisition and lead to non-ideal outcomes that increase government costs. Our research follows the methodology of C. Wang's 2014 research and C. Wang and J. San Miguel's 2012 research, both published in the Journal of Public Procurement, in conducting biographical analysis of corporate governors and comparative analysis of return on assets (ROA) against non-defense firms, controlled for size and industry standard industrial classification. This research seeks to identify if the political connections of Top 100 Defense Contractors leadership over a 10-year period affect government cost outcomes. Our research finds that DOD contractors earned 0.9% additional ROA above non-defense firms, equating to $11.4 billion in excessive profitability. Among the variables examined, only the percentage of politically heavily connected directors at a given firm holds a marginally significant explanatory relationship to difference in ROA between control and sample firms. This should encourage additional research with different data sets and further examination of the impact of social connection as a piece of the excessive profitability puzzle.

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ABOUT THE AUTHORS

LCDR Joseph C Brewen currently attends Naval Postgraduate School to earn his Master of Business Administration with an emphasis in Acquisition and Contract Management in June of 2020. Born in Charlotte, North Carolina, he graduated with a Bachelor of Arts degree in 2006 from the University of Minnesota at Duluth and received his commission in 2008 through Officer Candidate School. Upon completing the Supply Officer Basic Qualification Course, he reported to USS ENTERPRISE (CVN 65) as the Disbursing Officer. Completing a 24-month Division Officer tour, he volunteered for a Global Support Assignment (GSA) to Camp Lemonnier Djibouti as the Transportation Officer. LCDR Brewen reported to Fleet Logistics Center Sigonella Detachment Rota (FLCSI-ROTA) in July of 2012 as the Supply Operations Officer; responsible for both Fleet Logistics Center and Business Office divisions. He then reported to NAVAIR Patuxent River in August of 2014 as a BFM Intern working in Naval Aviation Training Systems program (PMA-205) and the H-1 USMC Helicopter program (PMA-276). Completing Department Head School in October 2016 he reported as the Supply Officer on board USS KIDD (DDG 100). During his tour he completed a seven-month deployment to 5th and 7th fleet AOR as well as a six-month Selected Restricted Availability. His professional certifications include DAWIA Level 1 in Business Financial Management, DAWIA Level 1 in Program Management, and Joint Professional Military Education Level I. His personal awards include the Navy Commendation Medal (3) and the Navy and Marine Corps Achievement Medal (3) along with a number of unit and campaign awards. He is qualified as a Surface Warfare Supply Corps Officer.

LCDR Dave Couchman is a Master of Business Administration Candidate – Acquisition and Contracting Management program at Naval Postgraduate School, Monterey, CA. A native of Raritan, NJ, he holds a BA from Arizona State University and an MS from Oklahoma State University. At sea he served as Supply Officer, USS BOISE (SSN-764) in Norfolk, VA and Stock Control Officer, USS NIMITZ (CVN-68) in Bremerton, WA. Ashore, he served as Deputy Director/Logistics Support Officer, NAVSUP Fleet Logistics Center Yokosuka, Sasebo, Japan and Flag Aide to the

Commander, Defense Logistics Agency (DLA) Aviation, Richmond, VA. Dave is a recipient of the prestigious Navy League VADM Robert F. Batchelder Award for the "most significant personal contribution to the supply readiness of our operating forces." Personal decorations include the Defense Meritorious Service Medal, Navy and Marine Corps Commendation Medal (four awards), Navy and Marine Corps Achievement Medal. He is a qualified Naval Aviation Supply Officer, Submarine Supply Officer, and Surface Warfare Supply Corps Officer.

LCDR Chris Harvey currently attends Naval Postgraduate School to earn his Master of Business Administration with an emphasis in Acquisition and Contract Management. Born in Jacksonville FL, LCDR Harvey graduated with a bachelor's degree in 2008 from the University of North Florida and received his commission in 2009 through Officer Candidate School. At sea LCDR Harvey served as Assistant Supply Officer onboard USS LABOON (DDG 58) where he led logistics operations during a seven-month deployment to both the 5th and 6th Fleet in support of Operation OCEAN SHIELD. He served as the Food Service Officer, Disbursing Officer, and Sales Officer where he led his team to the Supply Logistics Blue 'E' in 2010 and 2012. For his Department Head tour, he served onboard USS ANTIETAM (CG 54) as the Supply Officer stationed out of Yokosuka Japan. While there the ship earned the Supply Logistics Blue 'E' in 2016 and 2017 and the Best in Class (Medium Group 2) for Logistics Readiness Excellence Award in 2017. Upon completion of his tour onboard USS ANTIETAM, he served on Commander, Seventh Fleet Staff as Staff Supply Officer. While ashore he served as the as the Officer in Charge for Aviation Support Detachment Atsugi, Japan. Lead his is team to three consecutive Ashore Blue "E" Awards in 2013-2015. He has earned supply warfare qualifications in Naval Aviation Supply Officer and Surface Warfare Supply Corps Officer. His personal awards include Navy Commendation Medal (3), Navy Achievement Medal, and various campaign and unit awards.

ACKNOWLEDGMENTS

This thesis was completed during an unprecedented global pandemic, which has fundamentally reshaped education at NPS. It was finalized during a mandatory quarantine to prevent further spread of COVID-19. All of us were suddenly balancing full schedules of Zoom classes, unexpectedly homeschooling our children, balancing working spouses, and trying to hold onto our sanity. None of us have any idea when and if we will step foot on campus, or if our graduation will happen.

Our team would like to first thank Dr. Chong Wang for emboldening us to ask the hard and uncomfortable questions that others choose to avoid. We also appreciate Dr. Alan Ballard for his patience, knowledge, and great humor in helping us survive doing a data project in Excel, which is akin to self-torture. Both of them suddenly picked up all the same additional workload we did, but together we managed to finish it up.

Dave thanks Michiko for providing the support and home structure needed to make this research vision come to reality, and his daughter, Avery, and son, Case, for always making sure Dad doesn't take life too seriously.

Joe thanks his wife, Suzanne, for providing the support to allow the time needed to research and write the thesis with his partners.

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LIST OF ACRONYMS AND ABBREVIATIONS

CEO	Chief Executive Officer
DOD	Department of Defense
GDMA	Glenn Defense Marine Asia
MDAP	Major Defense Acquisition Program
NAICS	North American Industry Classification System
NYSE	New York Stock Exchange
PMR	Profit Margin Ratio
RCOE	Return on Common Equity
ROA	Return on Assets
SEC	Securities and Exchange Commission
SIC	Standard Industry Classification

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I. INTRODUCTION

The government is entrusted with spending taxpayer dollars, and with that comes a moral responsibility to be responsible stewards. It is through our oaths of office that officers in the U.S. military assume a national leadership role. As such, there is inherent accountability to our core ethos, oaths of service, and fellow taxpayers. With that accountability comes the need for efficiency with limited government resources. Unfortunately, one does not have to look hard to find cost overruns in major defense acquisition programs (MDAPs), with notable recent examples including the F-35 Joint Strike Fighter, Littoral Combat Systems, and the *Gerald R. Ford*–class aircraft carrier. According to a Deloitte study conducted in 2016, the combined cost overrun for MDAP portfolio programs in 2015 was $468 billion, up from $295 billion in 2008 (Deloitte, 2016). This constitutes a basic failure of our government stewardship role in how U.S. military members use taxpayer money. But why are we experiencing such frequent and significant cost overruns in our most expensive programs?

This research presents highly personal motivation for the researchers. Lieutenant Commander Couchman was stationed at Naval Supply Systems Command, Fleet Logistics Center Yokosuka, Site Sasebo, Japan, from 2012 to 2015. Having reported there in fall 2012, he had only gotten his feet wet when fitness report time came in January 2013. His executive officer, Commander Jose Luis Sanchez, was conducting a site visit in Sasebo and provided the usual debrief. CDR Sanchez implored the young lieutenant to remember that above all, being ethical was the highest calling. On January 6, 2015, CDR Sanchez was arraigned for "do(ing) and omit(ting) to do acts in violation of his official duties, including providing to GDMA and Francis classified and other proprietary, internal U.S. Navy information and using his position and influence with the U.S. Navy to benefit GDMA, all in violation of Title 18, United States Code, Sections 201 (b)(2)(A) and (C)" (*United States of America v. Sanchez*, 2015). Over the remaining 30 months of his tour, LCDR Couchman would see two from his command and half a dozen other colleagues he worked with across various other commands arrested in the Department of Justice investigation of Leonard "Fat Leonard" Francis and Glenn Defense Marine Asia (GDMA). LCDR Couchman, LCDR Harvey, and LCDR Brewen all felt the later fallout from this

scandal as operational supply officers on an aircraft carrier, cruiser, and destroyer respectively. High profile Department of Defense (DOD) failures like the GDMA scandal press the urgent need for additional research on connection and cost outcomes. Excessive government husbanding service contract costs were incurred though senior officer connections, including 60 admirals (Whitlock, 2017), who performed inherently political duties in a variety of command and staff roles. Though $35 million in excess costs borne of a complex network of connections and kickbacks was ultimately forfeited by Leonard "Fat Leonard" Francis (Whitlock, 2017), the true costs to the DOD are still not known to this day. The commonality between all arraigned was that they ultimately used their positional influence and connections to drive excessive profits for a defense contractor.

We have inherent responsibilities for accountability and efficiency in defense acquisition. Why should we care or focus on the accountability and efficiency of defense spending beyond what is currently being done? Surely with the intense scrutiny on audit readiness, we are already demonstrating our financial stewardship. The size of the DOD budget relative to other discretionary programs speaks volumes and carries an inherent responsibility to exercise the highest levels of stewardship and efficiency.

Figure 1 presents a striking visual of how much of our national discretionary budget is dedicated to defense spending. The United States spends 15% of the annual federal budget and 50% of the discretionary budget on defense spending. We spend more on defense ($649 billion in 2018) than China, Saudi Arabia, India, France, Russia, the United Kingdom, and Canada *combined* ($609 billion in 2018; Peter G. Peterson Foundation, 2019).

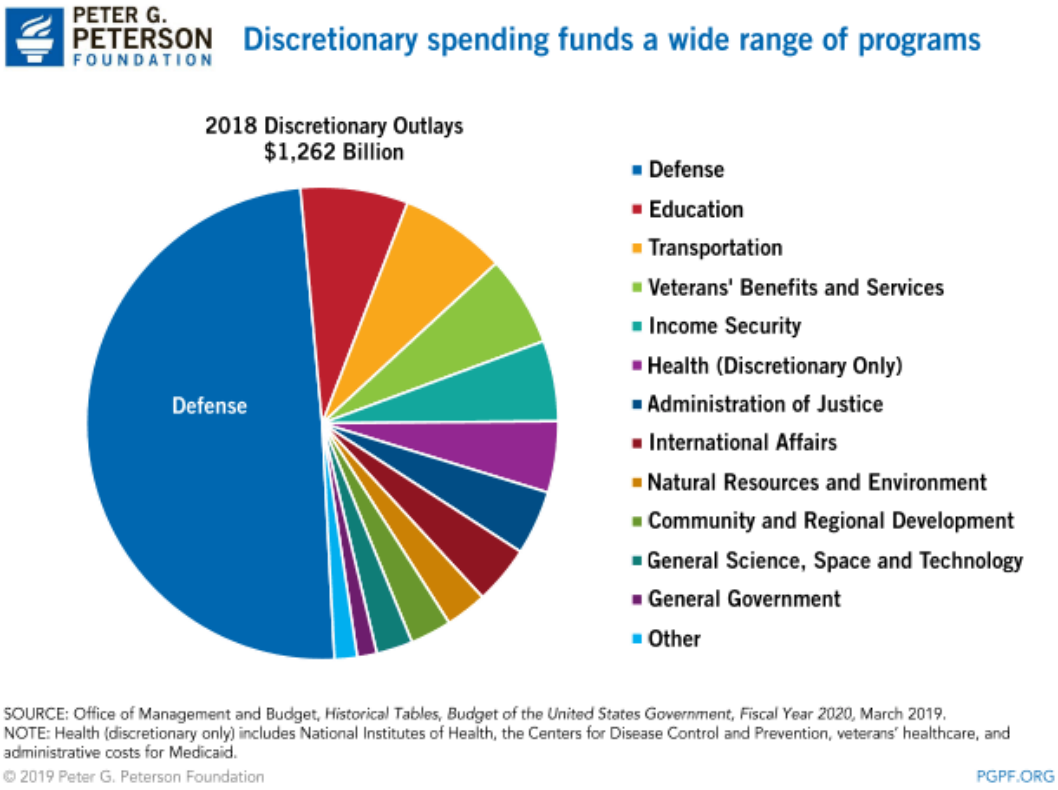

Figure 1. U.S. Government 2018 Discretionary Outlays. Source: Peter G. Peterson Foundation (2019).

There is ample ground for academic research to better understand any potential relationship between political connection and cost outcomes in our largest federal spending sector. While the GDMA scandal is highlighted by cavalier corruption, which we do not assert is ubiquitous in DOD acquisition, the incident ties influence to undesirable cost outcomes and those adverse cost outcomes to political connection within the DOD acquisition orbit. The influence that political connection has on DOD acquisition cost outcomes is a long-standing debate with widely held beliefs that there is an existing relationship, combined with limited academic research supporting these notions. Perceptions of corporate excess and government waste permeate the national consciousness, and waste is a burden borne ultimately by taxpayers. With the DOD frequently operating under continuing resolutions, the effective expenditure of dwindling or stagnant tax dollars becomes paramount. The potential public policy ramifications dictate further research.

Our defense-centered academic research aims to provide acquisition authorities and policy-makers actionable advice based on quantified data and in-depth analysis. Ultimately, waste experienced in DOD acquisition reduces available dollars that could otherwise directly support warfighting, readiness, and sustainment.

A. RESEARCH QUESTIONS

Our primary research question explores how the political connection of defense contractors, measured by board of directors' prior employment history, influence political and social welfare. What are the impacts of political connection, and do the behaviors of those with such connections serve to benefit society or detract from it? The impacts are far from unambiguous. Wang's (2014) research was the last to meaningfully explore this subject specifically within defense acquisition. Our research revisits the topic with more robust criteria and bridges the time from that study to the present day.

This leads to our secondary research question. Are those politically connected corporate governors opportunistic, benevolent, or neither? Ultimately, does political connection lead to more pronounced excessive profitability within the defense sector? Wang (2014) essentially found unexpected benefits of political connection likely assisting firms in navigating bureaucracy prior to 2008; whether this result holds true after 2008 remains to be tested.

Our research takes a neutral hypothetical approach to these questions. We do not assume any particular pattern of behavior but merely seek to analyze and map political connection and subsequent effects over time. To accomplish this, we utilize data in order to make conclusive statements on the effects of political connection on profitability within the defense sector. These findings enable researchers to make specific public policy recommendations based on data as opposed to unproved beliefs.

B. STATEMENT OF PURPOSE/CONTRIBUTION

This research follows the model created by Wang and San Miguel (2012) in conducting a comparative analysis, though we will make claims regarding the effect that political connection has on excessive profits. This paper contributes incrementally to the existing academic discussion in several ways. First, we achieve this by deepening the

definition of political connection beyond prior compensated employment of a named director to include inherently political positions, political action committee leadership, and lobby group leadership. We follow Wang's (2012) keyword-search model to assign political connection values to corporate leadership and empirically quantify political connection, but instead of approaching connection as a single "yes" or "no" question, we stratify the level of political connection based on its relative weight and perceived value, and then assign a "yes" or "no" to each category. While our goals similarly align with Wang and San Miguel (2012) and Wang (2014) in examining the relationship between the political connection of DOD contractors and excessive profits compared to non-defense counterparts, this research does not assume that DOD contractors' profits are excessive. Wang (2014) analyzed 2008 with his connection model, and our research increases the examined time horizon to 10 years (2009−2018). Increasing the window of study allows us to monitor changes and conduct trend analysis to inform policy-maker decision-making. We would like to investigate if politically connected firms receive more favorable contract terms or a higher preponderance of cost plus–type or other incentive-laden contracts, and whether politically connected firms are more or less likely to be investigated by regulatory authorities.

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II. LITERATURE REVIEW

We need to understand the existing body of academic literature on excessive profits and political connection both separately and in tandem to best approach our research question.

A. EXCESSIVE PROFITS

Empirical evidence on whether defense contractors earn excessive profits are mixed. Bohi (1973) used a 36-firm sample to conclude "there is no evidence for arguing that defense business is any more or less profitable than nondefense business in general" (p. 728). Lichtenberg (1992), however, noted defense contractors earn 68% to 82% more return on assets (ROA) than their non-defense peers, which Rogerson (1994) attributed to the cost-based nature of DOD purchases. This ties to a cost-shifting hypothesis (Thomas & Tung, 1992), which argues that defense contractors have two different categories of revenue streams: DOD and commercial business. Assuming DOD contracts are cost-plus based, firms have incentives to shift overhead cost from commercial to DOD business, resulting in a higher profitability margin (Wang & San Miguel, 2012). Wang and San Miguel's hypothesis is supported by the defense sector's use of "excess direct labor since the overhead allocation is traditionally based upon direct labor measures" (Wang and San Miguel, 2012, p. 388). However, a later study by McGowan and Vendrezyk (2002) cast doubt on the validity of a cost-shifting hypothesis proposed by Thomas and Tung (1992). Wang and San Miguel (2012) compared DOD contractors' ROA, return on common equity (RCOE), and profit margin ratio (PMR) to those of their nondefense peers. They found that several defense contractors earn excessive profits, and those excessive profits were more pronounced after 1992, consistent with a period of industry consolidation. Wang and San Miguel noted that DOD contractors' corporate governance efficacy, measured by the dual role of the chief executive officer (CEO) and chairman of the board, negatively correlated to excessive profits.

B. POLITICAL CONNECTION

There is no unanimously agreed-upon definition of "political connection," and its meaning has been differently interpreted depending on the academic community conducting the research (economics, political science, etc.). Wang (2014) discussed three different definitions of political connection. The definition of political connection we use in our research is "derived from the board of directors' prior employment history in the federal government, including in the legislative, executive, and judiciary branches, and in the military services" (p. 102).

The most useful starting point toward fleshing out a useful academic definition is the following: "A company is defined as being connected with a politician if at least one of its largest shareholders (anyone controlling at least 10 percent of voting shares) or one of its top officers (CEO, president, vice-president, chairman, or secretary) is a member of parliament, a minister, or is closely related to a top politician or party" (Faccio, 2006, p. 369). However, in the United States the myriad regulations and ethics codes on acting in simultaneous private corporate officer and elected office roles are so significant and widespread as negate any realistic possibility of it happening (Wang, 2014, p. 102), which means that Faccio's definition does not translate to U.S. business well. Correia (2012), Ang and Boyer (2000), and Roberts (1990) followed a second definition, which associated political connection directly to campaign contributions and lobbying. Correia's (2012) research investigated and supported the claim that increased campaign contributions and lobbying decreased a firm's likelihood of a Securities and Exchange Commission (SEC) audit and subsequent penalties for noncompliance. Wang (2014) dismissed this definition as a "noisy measure of political connection" (p. 102). The third and most applicable definition, which Wang operated from, looked to examine the effect that prior employment in a federal government office of any branch or senior-level military service carried forward into corporate governance-related employment. As our research builds incrementally from Wang and San Miguel's (2012) model and expands the area of search defined in Wang (2014), this is the academic definition we use going forward.

C. EXCESSIVE PROFITS AND POLITICAL CONNECTION

Nearly 26 years ago, Rogerson expressed the following sentiment, which still holds true today:

> Defense procurement is unique among regulated industries in the United States in that economists have played virtually no role in helping shape its regulatory practices and institutions. Perhaps this is due to the barrier to entry created by the need to first learn about procurement practices or to a lingering distaste for military matters among academics. Whatever the reason, this lack of economic input is unfortunate, because many of the regulatory and policy issues in defense procurement involve the types of incentive issues that economists are very good at analyzing. My own hope is that economists are on their way to colonizing this new policy frontier. (1994, p. 87)

The academic discussions on the relationship between political connection and possible excessive profitability within the DOD acquisition sphere is extremely limited. The topic of political connection has been extensively studied for nondefense sector firms, but it has not been studied much for those that derive a majority of their profits from the defense sector. Wang (2014) is one of the few studies that shed light on this. Wang's research firmly placed this discussion within the sphere of DOD acquisition by using a data-driven approach. He investigated whether political connections create excessive profitability with DOD contractors and favorable outcomes with their political connection. Using the 2008 spend and relationship data, Wang used a keyword search model to identify political connection within Compustat, which is hosted by Wharton Research Data System (WRDS). He took the total number of politically connected directors divided by the total number of directors to achieve a percentage of political connection, an approach we also follow. Wang evaluated a three-year range that included the base year of 2008, the previous year, and the year after, which yielded a total of 276 firm-years examined. The evidence showed that better connected firms derive a higher percentage of revenue from DOD contracts and earn excessive profits. Based on the data, he rejected that political connection was corruptive in nature.

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III. DATA

In order to best make sense of the problem presented, we must first determine the top DOD contractors to prevent a robust, representative sample of the industry. This begets the need for a comprehensive source of biographical information and corporate financial data for the private sector. From there, we can further distill our information into a useable decision-making framework.

A. DATA SOURCE

Our research initially looked at the top 100 defense firms across a 10-year period, 2009 to 2018, which were further stratified by total government spending. We extracted total spending data from the open-source *Defense News* top 100, stratified by government spend with a given company. In 2018, the combined revenue of the top 100 defense firms from the DOD totaled $222.3 billion, approximately 32% of the entirety of defense spending for that year (Defense News Top 100, n.d.). This was an increase of 6% from the prior year's defense outlays. This gave us a sizable sample to draw from. Our further focus was placed on evaluating publicly traded U.S. firms, and other companies were removed from evaluation due to the limited data availability. Table 1 provides an overview of the distribution of the CEOs and directors we examined during this study. It must be noted that there is year-to-year overlap of companies, CEOs and directors year to year. Corporate officers can hold offices for multiple years, and companies can maintain a spot or drop entirely from the Top 100 firms year to year. Individual corporate officer changes occurring in a given year reflect in next year's data with the new officer.

Table 1. Total CEOs and Directors Evaluated by Year

	Public Firms	Directors
2009	35	395
2010	33	341
2011	35	407
2012	32	395
2013	33	344
2014	36	384
2015	31	357
2016	30	274
2017	32	308
2018	33	365
Totals	330	3470
	Firm Years	**Director-Firm Years**

Raw corporate data pulled from Wharton Research Data Systems Compustat and compared to Defense News Top 100 U.S Publicly Traded Firms, see Chapter III Section A for details.

Accounting data, as well as director and CEO data, was extracted from Wharton Research Data Services (WRDS) Compustat. Key data sets used included stock tickers, company name, corporate leader name, tenure, biographical information discussing employment history, and current position held.

B. DATA

Using our list of the top 100 defense firms from 2009 to 2018, extracted from *Defense News,* we first identified and segregated the U.S. publicly traded firms for analysis as shown in Table 2.

Table 2. List of U.S. Publicly Traded Firms Included in Analysis

	Ticker	Company Name		Ticker	Company Name
1	ACM	AECOM Technology Corporation	26	HRS	Harris Corporation
2	ACN	Accenture Ltd	27	ITT	ITT Corporation
3	AIR	AAR Corp.	28	JEC	Jacobs Engineering Group Inc.
4	AJRD	AEROJET ROCKETDYNE HOLDINGS, INC	29	KBR	KBR, Inc.
5	BA	Boeing Company (The)	30	LDOS	Leidos Holdings, Inc.
6	BAH	Booz Allen Hamilton Holding Corporation	31	LLL	L-3 Communications Holdings, Inc.
7	BLL	Ball Aerospace & Technologies	32	LMT	Lockheed Martin Corporation
8	CACI	CACI International Inc.	33	MANT	ManTech International Corporation
9	COL	Rockwell Collins, Inc.	34	MOG.A	MOOG INC.
10	CSC	Computer Sciences Corporation	35	NAV	Navistar International Corporation
11	CUB	Cubic Corporation	36	NOC	Northrop Grumman Corporation
12	CW	Curtiss-Wright Corporation	37	OSK	Oshkosh Corporation
13	DCP	Dyncorp Inc	38	PRSP	PERSPECTA INC.
14	EGL	Engility Holdings, Inc.	39	RTN	Raytheon Company
15	FLIR	FLIR Systems, Inc.	40	SAIC	Science Applications International Corporat
16	FLR	Fluor Corporation	41	SRX	SRA International, Inc.
17	FRPT	Force Protection, Inc.	42	TDY	Teledyne Technologies Incorporated
18	GD	General Dynamics Corporation	43	TXT	Textron Inc.
19	GE	General Electric Company	44	URS	URS Corporation
20	GFF	Griffon Corporation	45	UTX	United Technologies Corporation
21	GR	Goodrich Corporation	46	VEC	VECTRUS, INC.
22	GY	GenCorp Inc.	47	VSAT	ViaSat, Inc.
23	HII	Huntington Ingalls Industries, Inc.	48	VSEC	VSE Corporation
24	HON	Honeywell International Inc.	49	XLS	Exelis Inc.
25	HPQ	Hewlett-Packard Company			

Raw corporate data pulled from Wharton Research Data Systems Compustat and compared to Defense News Top 100 U.S Publicly Traded Firms, see Chapter III Section B for details.

We integrated actual rank (out of 100), defense spending information and percentage of total revenue from the DOD into our Compustat output. We further included the stock ticker information for each firm through a simple Google search. Among this sample, a preponderance of firms (94%) were or are traded on the New York Stock Exchange (NYSE), with the remainder traded on NASDAQ. Table 3 provides a statistical summary of the number of firms, revenue generated from the DOD, and what percentage of total company revenue is earned from the DOD across our 10-year study.

The DOD contracts with a wide swath of firms for needed goods and services to support an equally wide swath of mission sets. As such, the industries that the defense acquisition sector conducts business with are varied. Using the Compustat database and comparing it to North American Industry Classification System (NAICS) search results (https://naics.com/search), we identified each firm's two-digit Standard Industry

Classification (SIC) for analysis. Our research spanning 331 total firm-years covers 15 distinct sectors as delineated by two-digit SIC. Table 4 provides the distribution by two-digit SIC of our sample firms.

Table 3. Summary of U.S. Publicly Traded Firms by Rank and Stock Ticker

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Firm Count	35	33	35	32	33	36	31	30	32	33
Defense Revenue - Avg (mil)	$ 6,532.53	$ 7,408.65	$ 7,344.52	$ 7,597.81	$ 7,134.70	$ 6,193.83	$ 5,630.11	$ 6,514.44	$6,485.38	$6,405.21
Defense Revenue - Max (mil)	$ 39,550.00	$ 42,025.70	$ 42,800.00	$ 43,978.00	$ 44,883.00	$ 40,494.00	$ 29,000.00	$ 40,596.00	$43,468.00	$47,985.00
Defense Revenue - Min (mil)	$ 389.00	$ 559.90	$ 5.00	$ 491.20	$ 527.80	$ 426.20	$ 535.50	$ 577.30	$551.20	$597.60
Defense Revenue - StDev (mil)	$ 9,622.89	$ 10,571.40	$ 10,379.66	$ 10,113.94	$ 9,944.75	$ 9,104.95	$ 7,157.69	$ 9,553.44	$9,729.73	$9,728.94
% Rev from Def - Avg	49.45%	51.28%	53.06%	52.04%	48.86%	47.89%	47.40%	49.99%	52.25%	51.70%
% Rev from Def - Max	100.00%	100.00%	100.00%	100.00%	95.40%	99.60%	98.00%	100.00%	100.00%	100.00%
% Rev from Def - Min	1.70%	1.50%	0.80%	1.80%	2.20%	2.80%	2.00%	3.68%	4.00%	4.00%
% Rev from Def - StDev	27.64%	28.27%	28.77%	29.29%	29.88%	30.75%	27.87%	28.95%	29.64%	28.97%

Raw corporate data pulled from Wharton Research Data Systems Compustat and compared to Defense News Top 100, U.S Publicly Traded Firms; see Chapter III Section B for details.

Table 4. Frequency Distribution by Year of Two-Digit SIC

Industry Name	2 Digit SIC	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Oil & Gas Extraction	13	0	0	1	0	0	0	0	0	0	0
General Contractors & Operative Builders	15	1	1	1	0	0	0	0	0	0	0
Heavy Construction, Except Building	16	3	3	3	2	2	2	1	1	2	2
Fabricated Metal Products	34	1	0	0	1	1	2	1	1	0	1
Industrial Machinery & Equipment	35	3	3	3	3	2	2	3	1	1	1
Electronic & Other Electric Equipment	36	1	0	0	0	1	1	1	1	1	1
Transportation Equipment	37	10	10	10	11	11	11	11	10	13	11
Instruments & Related Equipment	38	6	6	6	6	6	6	3	4	3	4
Wholesale Trade - Durable Goods	50	1	1	1	1	1	2	1	1	1	1
Furniture & Home Furnishings	57	0	0	0	0	0	0	0	0	0	0
Business Services	73	4	5	5	5	5	6	5	5	5	6
Engineering & Management Services	87	3	2	3	1	2	2	3	4	4	4
Non-Classifiable Establishments	99	2	2	2	2	2	2	2	2	2	2

Raw corporate data pulled from Wharton Research Data Systems Compustat and compared to NAICS Search Engine SIC lookup, https://naics.com/search, see Chapter III Section B for details.

We then individually analyzed biographical information for political connection based on predefined parameters. Given those predefined parameters, we classified CEOs and directors as "political heavyweights," "politically connected," or not connected. "Political heavyweights" were defined as having a substantial level of connection at the most senior levels of government. We assessed "political" connection as those individuals that met a lesser criterion but would still qualify as connected by a reasonable person. In cases where we classified an individual as holding political heavyweight connection, they were then logically classified as holding political connection as well. As such, the mathematical difference between the total number of those corporate officers with political heavyweight (*ph*) connection and political (*p*) connection represents the total number of those only holding political connection (*p - ph = p only*). For severity analysis, the team created two levels of evaluative criteria for identifying political connection. Integrating and building upon the keyword model developed by Wang (2014), we then evaluated political connection under the following defined criteria:

Qualifications for political heavyweight: Former or current federal elected official (president, vice president, senator, congressman, etc.), former cabinet official, former state governor, former service component commander, combatant commander, supreme allied commander, or other three- or four-star command or vice role; admiralty or generalship requiring appointment in place of board action (three- or four-star position); former head or deputy of a major governmental agency; former undersecretary or assistant secretary of defense in any position; former or current service in any presidential appointment, including specific mention in the biography; leadership of a major political action committee; appointment of ambassadorship or as a U.S. trade representative.

Qualifications for political influence: Anyone meeting aforementioned political heavyweight criteria; service on a governmental advisory board; service on a political action committee or special interest board with the express intent of advancing items of interest for a particular group; service on the board of a nationally recognized organization (i.e., Boy Scouts of America, American Heart Association, Boys and Girls Club, etc.); requested by secretary of the Department of the Treasury to assume leadership position of bankrupt, troubled, or failed company as delineated in their biography; stated senior-level

consulting services provided to federal government or advisory boards as demonstrated in their biography.

These evaluative criteria require a simple "yes" or "no" answer to the questions of political weight or connection congruent to Wang and San Miguel's (2012) approach, and appropriately assigned values to each person. Once a CEO or director was noted as having political heavyweight or political influence, that classification necessarily carried through all years regardless of whether later iterations of their biographies chose to include them. Given the approach, the absence of available biographical information was assessed as the absence of political connection in a given year unless we classified the individual as having a political connection in prior years.

Tables 5 and 6 present a statistical summary of level of political affiliation assessed within our sample firms for CEOs and directors between 2009 and 2018. For example, Dennis Muilenberg was the CEO of Boeing in 2018 while concurrently serving as the chairman of the Board of Aerospace Industries Association, one of the country's largest defense special interest and lobby groups. We classified him as both a political heavyweight and being politically connected.

Table 5. Raw Totals Evaluated for CEOs by Year

CEO_Political_Heavyweight										
Year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
YES	0	0	1	1	3	4	2	3	2	2
NO	35	33	34	31	30	32	29	27	30	31
Yes_%	0.0%	0.0%	2.9%	3.1%	9.1%	11.1%	6.5%	10.0%	6.3%	6.1%
CEO_Political										
Year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
YES	0	0	3	4	5	7	4	5	5	11
NO	35	33	32	28	28	29	27	25	27	22
Yes_%	0.0%	0.0%	8.6%	12.5%	15.2%	19.4%	12.9%	16.7%	15.6%	33.3%

Raw corporate data pulled from Wharton Research Data Systems Compustat and compared to Defense News Top 100, U.S Publicly Traded Firms; see Chapter III Section B for details.

Table 6. Raw Totals Evaluated for Directors by Year

	Director_Political_Heavyweight									
Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
YES	77	74	92	86	82	88	65	59	68	61
NO	318	267	315	309	262	296	292	215	240	204
Pol_Heavy_Yes_%	19.5%	21.7%	22.6%	21.8%	23.8%	22.9%	18.2%	21.5%	22.1%	23.0%
	Director_Political									
Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
YES	88	88	128	109	103	121	95	78	96	86
NO	307	253	279	286	241	264	262	196	209	179
Pol_Yes_%	22.3%	25.8%	31.4%	27.6%	29.9%	31.4%	26.6%	28.5%	31.5%	32.5%

Raw corporate data pulled from Wharton Research Data Systems Compustat and compared to Defense News Top 100, U.S Publicly Traded Firms; see Chapter III Section B for details.

We noted that most politically connected directors are also political heavyweights as a general trend. At this point, we reevaluated our political heavyweight evaluative criteria to ensure that they were not too lenient. After review, each was appropriate. For example, trade ambassadors are presidential appointees. It is logical to conclude that it requires political clout to be considered for such a position. Additionally, it makes logical sense to have a large degree of inherent connection on the board of directors of high-earning firms. One does not achieve such a position easily. It is from this point we have the baseline data that enables us to analyze the trends and impacts of political connection within the defense acquisition sector. In order to make assessments on profitability, we follow Wang and San Miguel (2012) in evaluating ROA for our sample firms given a particular year as determined by reported net income/total assets. Table 7 provides a descriptive statistical summary of ROA, net income, and total assets for the firms evaluated over our 10-year study.

Table 7. Profitability, Net Income, and Total Asset Overview

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Firm Count	35	33	35	32	33	36	31	30	32	33
ROA - Avg	5.86%	6.67%	5.82%	2.52%	5.38%	4.95%	4.88%	5.54%	4.59%	5.81%
ROA - Max	15.50%	16.78%	14.02%	14.32%	19.46%	16.41%	16.72%	19.95%	15.18%	16.61%
ROA - Min	-23.05%	0.56%	-11.40%	-37.76%	-10.80%	-9.84%	-10.35%	-0.49%	-8.99%	-7.23%
ROA - StDev	6.10%	3.39%	5.07%	10.67%	4.55%	4.80%	4.67%	4.01%	4.58%	4.61%
Net Income - Avg (mil)	$ 1,029.32	$ 1,444.08	$ 1,474.89	$ 548.26	$ 1,534.77	$ 1,534.32	$ 1,363.27	$ 1,525.81	$ 837.81	$ 824.81
Net Income - Max (mil)	$ 11,025.00	$ 11,644.00	$ 14,151.00	$ 13,641.00	$ 13,060.00	$ 15,233.00	$ 8,981.00	$ 8,829.00	$ 8,197.00	$ 10,460.00
Net Income - Min (mil)	$ (1,098.80)	$ 18.42	$ (465.80)	$ (12,650.00)	$ (898.00)	$ (619.00)	$ (6,127.00)	$ (10.81)	$ (5,774.00)	$ (22,355.00)
Net Income - StDev (mil)	$ 1,968.65	$ 2,494.65	$ 2,679.87	$ 3,669.64	$ 2,613.17	$ 2,885.24	$ 2,723.80	$ 2,213.97	$ 2,065.82	$ 4,730.18
Total Assets - Avg (mil)	$ 34,704.86	$ 39,535.84	$ 38,958.49	$ 39,627.57	$ 38,164.67	$ 35,284.27	$ 39,146.18	$ 29,591.09	$ 19,775.99	$ 29,158.36
Total Assets - Max (mil)	$ 781,818.00	$ 751,216.00	$ 717,242.00	$ 685,328.00	$ 656,560.00	$ 648,349.00	$ 492,692.00	$ 365,183.00	$ 96,920.00	$ 309,129.00
Total Assets - Min (mil)	$ 253.99	$ 288.43	$ 429.89	$ 1,026.32	$ 1,108.38	$ 1,194.61	$ 1,300.28	$ 465.31	$ 495.55	$ 572.24
Total Assets - StDev (mil)	$ 129,019.41	$ 128,281.67	$ 119,609.64	$ 119,113.06	$ 112,581.31	$ 106,972.98	$ 88,870.13	$ 66,545.16	$ 25,490.49	$ 58,116.20

Raw corporate data pulled from Wharton Research Data Systems Compustat and compared to Defense News Top 100, U.S Publicly Traded Firms; see Chapter III Section B for details.

With an understanding of reported profitability measures, it then allows us to compare our sample firms against the ROA of comparable nondefense firms operating in the same market sector as determined by SIC. That data enables us to make informed statements about the effect that political connection within corporate governance has on profitability for defense sector firms, thereby enabling us to make sound policy recommendations for the DOD.

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IV. DATA ANALYSIS

Once we collected data from Computstat, it required further distillation. We analyzed our data to see if the assumptions and trends were correct and that political connectedness leads to excessive profits in the defense sector.

A. POLITICAL CONNECTION: GENERAL OBSERVATIONS AND TRENDS

We first examined the level of connection among the chief executive officers across the 330 firm-year study. Figure 2 highlights that the overall level of political heavyweight connection among CEOs has increased 9.1% over the 10-year study, though that figure has remained relatively constant since 2014.

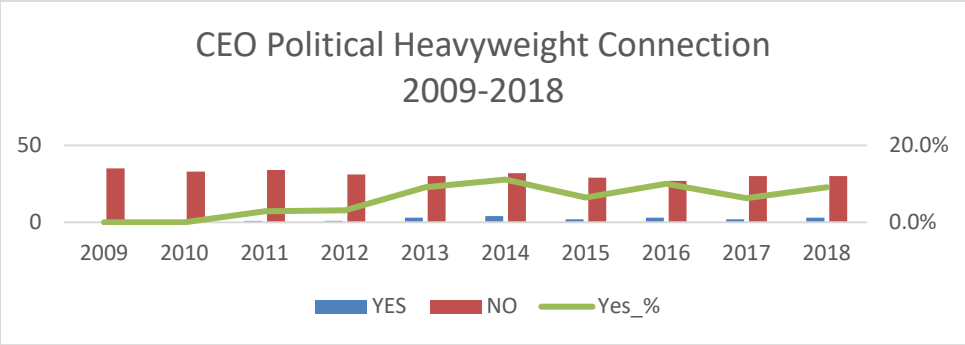

Figure 2. CEO Political Heavyweight Connection, 2009–2018

Logically, an increase in the level of political connection was also seen throughout the same period, though this category has experienced a more significant 33% increase since 2009. Over time, top defense contractors have become more likely to select a heavyweight-connected CEO. As Figure 3 demonstrates, this trend is even more significant when we relax from political heavyweight standards to politically connected standards.

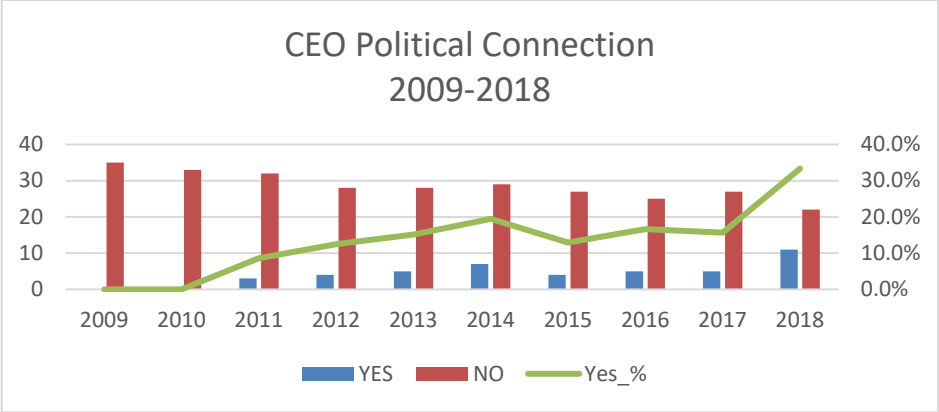

Figure 3. CEO Political Connection, 2009–2018

We then evaluated the political connection of directors. The political connection among boards of directors has not seen similarly pronounced increases as the CEO categories, however. This is at least partially attributable to a smaller denominator for CEOs than directors. Over the 10-year study, Figure 4 highlights the level of political heavyweight connection has remained relatively constant, hovering around 20%.

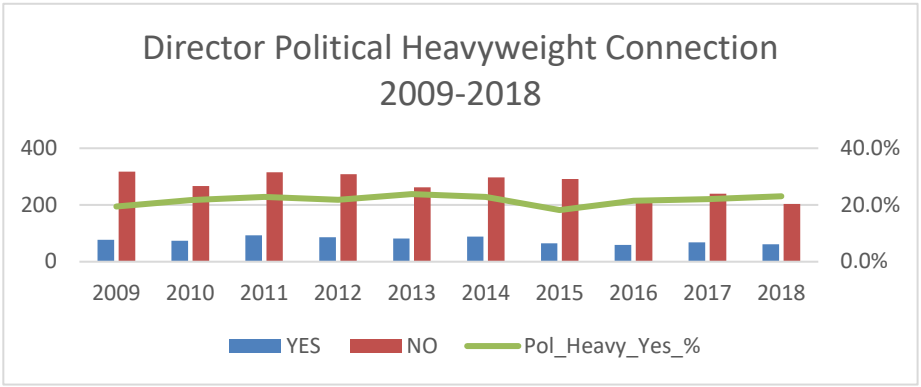

Figure 4. Director Political Heavyweight Connection

The general level of political connection, however, has increased 10.2% over the period of study and was at its highest level in 2018 as seen in Figure 5. This is consistent with the trend in CEO political connection over the same period.

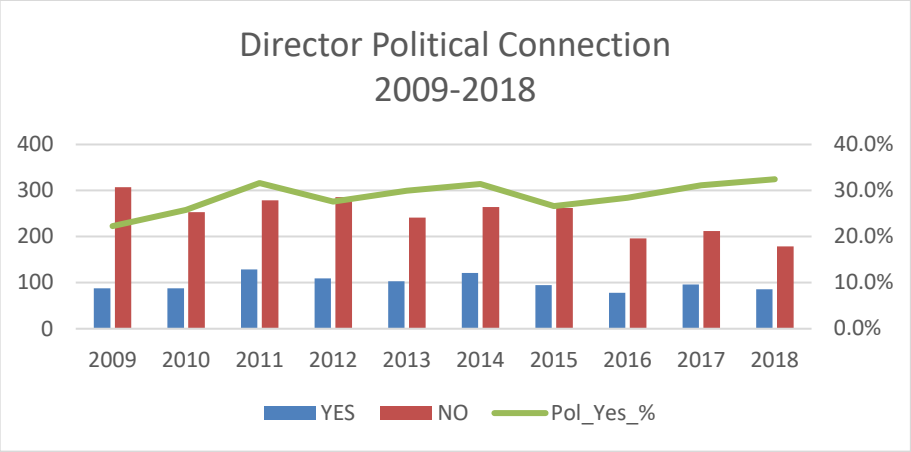

Figure 5. Director Political Connection

All four examined categories have been generally trending upwards since 2009, and more markedly so since 2014. Are there, however, any identifiable undesirable consequences for the DOD?

B. EXCESSIVE PROFITS: GENERAL OBSERVATIONS AND TRENDS

We followed Wang and San Miguel's (2014) methodology and evaluated across the 330 firm-year range spanning from 2009 to 2018. Using multivariate criteria to select control firms, our null hypothesis states that the mean ROA of DOD contractor firms is greater than that of control firms. In order to test this hypothesis, we selected control firms not affiliated with the DOD within our same Compustat data population that were operating in the same two-digit SIC category. We then identified the closest firm in terms of total revenue and used as a control firm, and subsequently measured ROA for both the sample and control firms by dividing net income and total assets. Using total revenue provides the researchers a common dollar-value threshold for size and business volume comparison, where selecting only control firms with comparable ROA would ignore the dynamics of similar size and not provide adequate control. For example, in 2018 Lockheed Martin falls under SIC 37 at $53,410.85 total revenue, and an evaluated ROA based on net income and total asset figures of 11.24%. The closest firm in terms of total revenue as a comparison for size under SIC 37 (transportation equipment) was Volvo AB/DR at $43,978.10 total revenue. We similarly evaluated Volvo's net income and total assets to arrive at 5.25% ROA. We then use the simple equation *sample ROA − control ROA = ROA difference.* A positive figure in this equation indicates the sample defense contractor is above control

firm ROA in the same industry, and a negative value presents the opposite. In this example, the Lockheed Martin's ROA was 5.99% higher than our non-DOD contractor control firm Volvo.

Table 8 presents a descriptive statistical summary of our sample and control firm ROAs used in this approach, which provides the necessary profit comparison for further examination of any potential relationship with political connection.

Table 8. Sample and Control Descriptive Statistics

Sample ROA		***SIC 2 Comp ROA***	
Mean	0.05214716	Mean	0.04313257
Standard Error	0.00312952	Standard Error	0.00361184
Median	0.05556954	Median	0.04268232
Mode	0.01023152	Mode	0.00919503
Standard Deviatior	0.05685053	Standard Deviatior	0.06561237
Sample Variance	0.00323198	Sample Variance	0.00430498
Kurtosis	17.5361744	Kurtosis	9.8884601
Skewness	-2.81386652	Skewness	-0.01306354
Range	0.5771222	Range	0.77508609
Minimum	-0.377603	Minimum	-0.28726038
Maximum	0.1995192	Maximum	0.48782572
Sum	17.2085613	Sum	14.2337494
Count	330	Count	330

At first glance, we note that there is a 0.9% difference in the sample and control firm ROA means. But is this statistically meaningful? In order to test for statistical significance, we conducted a two-sample z-test for means across our 330 firm-year study at the 90% (α =0.1), 95% (α =0.05), and 99% (α =0.01) confidence levels.

Table 9 presents a one-tail *p* value of 0.03 at all three confidence levels, and at 90% and 95% confidence we fail to reject the null hypothesis that the mean ROA of sample DOD contractor firms is higher than the mean ROA of our control firms. The introduction of benchmark firms allows us to control these results for firm size and industry. Defense contractors' mean excessive profit increase of 0.9% above control firms operating in the same industry is worth further exploring. But can political connection explain this increase?

We then evaluated the CEO's political connection per firm year as a basic evaluation of a firm's political connection. Table 10 presents the CEO sample group classified into four subcategories—politically heavy, not politically heavy, politically connected, and not politically connected—through meeting the evaluative criteria previously discussed. Out of the 330 firm years evaluated, 19 had politically heavy CEOs and 311 not politically heavy CEOs. Among the same sample, 44 CEOs were politically connected while 286 were not politically connected.

Table 9. Z-Test Sample and Control Firm Means

z-Test: Two Sample for Means (90%)			z-Test: Two Sample for Means (95%)			z-Test: Two Sample for Means (99%)		
	ROA	*C2 ROA*		*ROA*	*C2 ROA*		*ROA*	*C2 ROA*
Mean	0.05214716	0.04313257	Mean	0.05214716	0.04313257	Mean	0.05214716	0.04313257
Known Variance	0.00323198	0.00429194	Known Variance	0.00323198	0.00429194	Known Variance	0.00323198	0.00429194
Observations	330	330	Observations	330	330	Observations	330	330
Hypothesized Mean Difference	0		Hypothesized Mean Difference	0		Hypothesized Mean Difference	0	
z	1.8879064		z	1.8879064		z	1.8879064	
P(Z<=z) one-tail	0.02951926		P(Z<=z) one-tail	0.02951926		P(Z<=z) one-tail	0.02951926	
z Critical one-tail	2.32634787		z Critical one-tail	2.32634787		z Critical one-tail	1.28155157	
P(Z<=z) two-tail	0.05903852		P(Z<=z) two-tail	0.05903852		P(Z<=z) two-tail	0.05903852	
z Critical two-tail	2.5758293		z Critical two-tail	2.5758293		z Critical two-tail	1.64485363	

Table 10. Comparison of Political Connection Across Firm Years

	n-firm yrs	Sample Firm ROA	Total Assets	Total Revenu	Rev from Def	% Rev from Def	Mean ROA Diff	P-Value (a=0.05)
CEO Pol Heavy Y	19	6.43%	$ 31,732.61	$31,121.79	$ 20,345.64	72.54%	1.84%	0.187
CEO Pol Heavy N	311	5.14%	$ 34,643.26	$20,563.23	$ 5,944.55	49.04%	0.84%	0.017
CEO Pol Y	44	5.70%	$ 24,883.29	$23,181.07	$ 14,611.95	73.06%	1.12%	0.118
CEO Pol N	286	5.14%	$ 35,951.42	$20,861.93	$ 5,547.77	46.90%	0.87%	0.051
Population	**330**	**5.21%**	**$ 34,475.67**	**$21,171.15**	**$ 6,732.44**	**50.40%**	**0.9%**	0.030

Table 10 presents several immediate points of discussion. The firms with politically heavy and politically connected CEOs are larger firms measured by total revenue. Moreover, those politically connected firms earn a much bigger percentage of their total revenue from DOD business than nonconnected firms. For example, on average, 19 firms with politically heavy CEOs earn 72.54% revenue from the DOD as opposed to 49.04% for 311 firms without politically heavy CEOs. This is consistent with the empirical findings of Wang and San Miguel (2014) and Agrawal and Knoeber (2001); there logically exists a greater preponderance of politically connected corporate governors on the boards of companies that glean a bulk of their profit from government business lines. However, politically connected firms are smaller when measured by total assets, consistent with the fact that DOD contractors tend to obtain a more favorable financing structure due to their relationship with the government; hence they do not need to maintain a high level of assets that would otherwise be necessary to generate their revenue. In order to examine the statistical significance of mean ROA difference between politically connected and not connected CEOs, we conducted two sample t tests assuming unequal variances. While the chart demonstrates that firms with a politically heavy CEO earned 1.84% excessive profits, 1% bigger than those without a politically heavy CEO, this finding is at most marginally significant with a p value of 0.14.

We expressed the nature and level boards of directors' connection as a percentage. For example, in 2018 Boeing had three of 11 directors claim a political heavyweight connection in their biographies, which we expressed as 27.3% political heavyweight connection. Four of 11 Boeing directors in the same year noted some level of political connection, which was expressed as 36.4% connection. Table 11 presents a summary of mean level of political connection by category, by year. Mean connection levels in both categories have remained relatively constant over the 10-year study.

Table 11. Summary of Percent of Political Connection of Directors

Year	Pol Heavy %	Pol %
2018	22.3%	29.5%
2017	21.0%	28.9%
2016	20.9%	28.7%
2015	18.6%	27.1%
2014	22.8%	31.2%
2013	23.3%	29.2%
2012	21.2%	27.0%
2011	21.1%	29.0%
2010	21.4%	24.9%
2009	18.9%	21.3%
Population	21.1%	27.7%

Similar to Wang's (2014) approach, each sample firm-year's board of directors' corporate governance practices were evaluated as either independent or holding duality. Duality is expressed as holding a relationship to the board, including service as the current CEO, a former CEO, or an otherwise related director as delineated in Compustat.) When sorting our data under this lens, we identify 55 firm-years with independent chairmen of the board and 275 firm-years with duality of the CEO and chairman demonstrating consolidation of power was identified. Table 12 summarizes key findings.

Table 12. Corporate Governance Practice Key Statistics Table

	n-firm yrs	Sample Firm ROA	Total Assets	Total Rev	Rev from Def	% Rev From Def	Mean ROA Diff	p-value
Independent	55	6.12%	$ 20,938.87	$ 20,184.09	$ 7,063.82	58.3%	-0.20%	0.43
Not Independen	275	5.02%	$ 37,237.42	$ 21,890.57	$ 6,667.38	48.8%	1.10%	0.01
Population	**330**	**5.21%**	**$ 34,475.67**	**$ 21,171.15**	**$ 6,732.44**	**50.4%**	**0.9%**	0.03

It immediately jumps out that 83.3% of the firm-years chose the same person as the CEO and the chairman of the board. Also, those firm-years earned an additional 1.1% ROA above control firms, which is significantly higher than those 55 firm-years with better corporate governance, measured by separation of the CEO and chairman. This somewhat suggests that better corporate governance mitigates excessive profits.

C. MULTIVARIATE APPROACH

Using the difference between sample and control firm ROAs as our dependent (left-hand) variable, we conducted a series of single and multivariate regressions. The intent is to determine to what degree the level of political connection of a CEO or director and character of corporate governance can predict excessive profits in a DOD contractor

sample firm compared to a non-DOD contractor control firm. We further explore how the mean response of our dependent or Y variable, the excessive profitability of our DOD sample firms, responds to changes in our independent political connection and corporate governance variables. We utilized the following independent variables in our analysis:

- X1: Independence or Duality. We evaluated Compustat data outputs for the independence or duality of a current CEO as the chairman of the board of directors as a measure of corporate governance efficacy. Independent directors were assigned a dummy value of 1 (Yes), where those holding duality or other expressed relationship as quantified in Compustat were assigned a dummy value of 0 (No).
- X2: Percent of Politically Heavy Directors. We took the count of directors evaluated as politically heavy and divided by the total number of directors in every given year to express the level of affiliation as a percentage.
- X3: Percent of Politically Connected Directors. This followed the same methodology as used for X2 but referenced the political connection criteria. The level of connection was similarly expressed as a percentage.
- X4: Politically Heavy CEOs. We assigned a dummy variable to yes (1)/no (0) responses in each firm-year. This is expressed in binary as there is only one CEO per firm year.
- X5: Politically Connected CEOs. We assigned a dummy variable to yes (1)/no (0) responses in each firm-year. This is expressed in binary as there is only one CEO per firm year.

In order to demonstrate robustness, we completed a multivariable regression model to evaluate the relationship between our independent and dependent variables. Our models serve to see to what degree our independent X variables predict the difference in ROA above nondefense control firms (Y variable). We utilized dummy variables to evaluate our models, but their inclusion did not meaningfully change the results. Table 13 presents our findings in tabular format.

Table 13. Multivariate Regression Evaluation of Duality and Political Connection

Variable	Parameter Estimate	Std Error	t-value	Pr > |t|
Intercept	0.004	0.009	0.410	0.679
X1 - Duality	-0.011	0.011	-1.050	0.292
X2 - PH Dir %	0.152	0.067	1.570	0.117
X3 - Pol Dir %	-0.047	0.056	-0.850	0.396
X4 - PH CEO	0.006	0.027	0.240	0.811
X5 - Pol CEO	-0.007	0.019	-0.400	0.691

D. DISCUSSIONS: WHAT DOES THIS ALL MEAN?

Historically, it has been suggested that political connection among corporate governors has been corruptive outside of the DOD. For example, Correia (2012) noted that firms with political connections that experience accounting irregularities were not only less likely to be audited, but when they were audited, they experienced less significant penalties for noncompliance behaviors. As such, we are motivated to see how this impacts DOD contractors.

Wang (2014) found that political connection among DOD contractor CEOs and directors serves a potentially positive role and could potentially assist firms in managing the myriad regulatory and policy requirements inherent to DOD business lines. Violation of regulatory requirements through predatory political influence could have potentially catastrophic effects on the continuance of firms that derive a majority of their revenue from DOD business lines. The findings of our multivariate analysis of comparative ROA, which controlled for firm size and industry, are consistent with the body of academic research in that DOD contractors earn 0.9% excessive profits relative to their non-DOD contractor counterparts. For perspective, 0.9% of $1.3 trillion of 2018 discretionary outlays referenced in Figure 1 is $11.4 billion dollars of taxpayer money.

Increased levels of political connection evaluated in our research do not serve as a significant explanatory variable for the excessive profits realized by DOD contractors. However, there is some evidence to support that the percentage of politically connected heavyweight directors (X2) is marginally significant based on *p* value. This potentially is one piece of the excessive profit puzzle, but there was not sufficient evidence among our data to single it out as a major explanatory variable. This does potentially and marginally support a corruptive theory, but likely in tandem with other explanatory variables that our data set proved inadequate to fully develop.

In conjunction with political connection measures, we examined the potential relationship that corporate governance practices have to excessive profits or political connection. We used Wang's (2014) measure of duality of the CEO and the chairman of the board to determine the quality of corporate governance, where he explored the potential for "rent-seeking behavior" and potential resource misallocation. While those firms

demonstrating duality did earn a mean 1.1% additional ROA above control firms, there was insufficient evidence to support the notion that duality was a significant explanatory variable. The public nature of 10-K filings, accountability to shareholders, and huge penalties for corruption likely dissuade corruption. However, the top DOD firms focusing on ACAT-1 major weapons systems lack direct competition that often dissuades rent-seeking in the private sector.

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V. CONCLUSIONS AND ADDITIONAL RESEARCH AREAS

Lasering in on U.S. publicly traded firms across a 10-year span, we analyzed the relationship between excessive profits, political connection, and corporate governance. Our research did not identify a single major culprit of excessive profits. It did, however, support previous findings of excessive profitability and the notion that political connection is not necessarily corruptive in nature. Building upon the work of Wang (2014), our research further refined the definition of political connection and strengthened a replicable model than can easily be modified to fit other data sets to measure relationships with ROA. The marginally meaningful relationship between directors' political heavyweight connection and excessive profits supports the notion that there are likely multiple, not obviously related determinants working in concert that explain excessive profitability. This also suggests that our findings are in part a limitation of available data and time.

This research should motivate future examination into excessive profit. There were indications throughout our analysis of 3,470 unique biographies examined that there is room for additional research on social connection. It was a frequent observation that organizations like alumni associations are included on biographical data. It is also unsurprising that Ivy League and service colleges are frequently observed. Does shared interest or common belonging affect DOD cost outcomes? A similar disciplined, data-driven approach could shed light on social connection as a predictor for excessive profitability.

We noticed, for example, a substantial number of corporate officers that were also active members of the Aerospace Industrial Association, primarily those in the top half of firms as measured by revenue. This is expected behavior based on the inherently political nature of DOD contracting, given reliance on both the planning, programming, and budget execution process and annual appropriation. Conducting similar biographical analysis on lobbying activity and evaluating its relationship to excessive profits could further unweave factors explaining excessive profitability.

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