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ARTICLE



Acquire or Expire: Publicly Traded Defense Contractors, Financial Markets, and Consolidation in the U.S. Defense Industry

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ABSTRACT

The U.S. government increasingly outsources important national security responsibilities to defense contractors. In addition to manufacturing hardware and weapons, corporations now supply much of the specialized labor used by American defense and intelligence agencies to execute cyber operations, train foreign militaries, analyze top-secret information, and pilot unmanned aerial vehicles. This study examines the current state of affairs in the U.S. defense industry and demonstrates that publicly traded corporations are awarded the lion's share of U.S. contracting dollars spent on national defense. Subsequently, the inquiry argues that publicly traded corporations possess a competitive advantage over privately held companies in the U.S. defense industry because of their superior ability to raise capital through initial public offerings, follow-on share sales, and access to debt supplied by financial institutions. In recent years, publicly traded defense contractors have used these financial strategies to make major acquisitions, increase their competitiveness, and consolidate market share in the American defense industry.

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Introduction

In August 2018, U.S. President Donald J. Trump signed into law the John S. McCain National Defense Authorization Act. The law – which received bipartisan support in both the U.S. Senate and House of Representatives – authorized \$717 billion in defense spending for the American armed forces for the 2019 fiscal year (Macias 2018; Sherman 2018). If past is prologue, the Department of Defense (DoD) will spend roughly half this amount not on the regular military, but rather on goods and services provided by contractors (Duggan and Carril 2018; Schwartz, Sargent, and Mann 2018).¹ Between 2000–2017, the Pentagon's fiscal obligations to companies in the defense industry increased by 69 percent in inflation adjusted U.S. dollars, totaling \$320 billion in 2017 and accounting for 55 percent of DoD's budget (Department of Defense 2016; Schwartz, Sargent, and Mann 2018).² As evidenced by its escalating outlays on defense contractors, the U.S. government increasingly relies on corporations to perform important national security responsibilities (Singer 2003; Avant 2005; McFate 2014; Sapolsky, Gholz, and Talmadge 2017). Contractors no longer simply produce the hardware that intelligence agencies and the military use to carry out their missions, they now supply much of the specialized labor needed by the U.S. to execute cyber operations, support troops in the field, analyze top-secret information, and pilot unmanned aerial vehicles (Priest and Arkin 2011; Schmidt 2016; Maurer 2017). As a recent Congressional Research Service report noted: 'Without contractor support, the U.S. would be currently unable to arm and field an effective fighting force' (Schwartz, Sargent, and Mann 2018, 1).

With respect to defense contractors' ownership structure, the DoD and U.S. intelligence agencies work with two types of enterprises: publicly traded corporations that make their ownership shares available for purchase on exchanges such as the New York Stock Exchange and NASDAQ, and privately owned companies – which do not sell their shares on stock exchanges and are typically owned by a small number of individuals.³ Between these two categories, publicly traded corporations such as Raytheon, General Dynamics, Leidos, and CACI account for nearly 85 percent of U.S. expenditures on defense outsourcing (General Services Administration 2017). How have publicly traded defense contractors consolidated market share in the American defense industry in recent decades?

This inquiry identifies three financial strategies publicly traded contractors have used to spur growth through acquisitions since the end of the Cold War. First, publicly traded contractors raise capital through initial public offerings (IPOs) that take place when their shares are first made available for purchase on major stock exchanges. After IPOs occur, corporations' shares typically trade at a premium to their prior value – and to the price of the shares of privately owned companies (Koeplin, Sarin, and Shapiro 2000) – while the funds paid for shares by investors are often used to fund corporate expansion. Second, publicly traded contractors often engage in follow-on share sales, which involve selling additional equity in public markets to raise capital. As with IPOs, follow-on sales permit contractors to offer their shares to a large number of buyers at a price premium to what they could receive in private transactions. Third, because of their transparent accounting requirements and ties to major lending institutions, publicly traded corporations often have access to financing unavailable to their privately owned rivals (Schenone 2010; Saunders and Steffen 2011). While privately owned defense contractors may also secure debt from financial institutions and sell their shares to select investors, this study demonstrates that privately owned contractors cannot raise levels of capital equivalent to their publicly owned competitors. IPOs, follow-on share sales, and preferential access to financing have thus enabled publicly traded contractors to reduce competition through consolidation, resulting in the emergence of several large corporations that are presently indispensable to the operations of U.S. defense and intelligence agencies (Office of the Undersecretary of Defense 2008; Hensel 2010; Schwartz 2014).⁴

The remainder of this article is organized into five parts. The following section reviews literature examining recent trends in defense outsourcing and compares the market share held by publicly traded and privately owned companies in the U.S. defense industry. Subsequently, the article's theoretical section describes how publicly traded defense contractors can raise capital more efficiently than privately owned companies. In the U.S. defense industry – where growth often occurs through acquisitions rather than by companies increasing their customer base – publicly traded corporations' superior ability to accrue capital provides them with distinct advantages. Next, the inquiry's research design is outlined. Following this, the core theoretical arguments are tested using both within-case and across-case methods. Finally, the conclusion summarizes the study's major arguments and suggests directions for future research.

Defense Outsourcing in the U.S

The U.S. government is increasingly turning to corporations to provide goods and services in a broad range of fields.⁵ From 2014–2018, total federal spending on contractors across all departments and agencies increased by 25 percent, reaching \$560 billion in 2018 (Bloomberg Government 2018). While the U.S. government outsources in a wide variety of areas including healthcare, energy, and even federal penitentiaries, spending on defense dominates federal contract obligations – accounting for 63 percent of all contract dollars awarded in 2017 (Schwartz, Sargent, and Mann 2018). By comparison, Department of Energy spending on contracting accounted for 6 percent of federal outsourcing expenditures, while spending by Veterans Affairs and Health and Human Services each totaled 5 percent of all contract dollars awarded.

U.S. defense and intelligence agencies have an extensive history of outsourcing responsibilities to for-profit companies (Fredland 2004; Dunigan 2014). For example, the U.S. Air Force has historically worked with corporations in the aerospace industry to augment its technological capabilities (Gholz 2000). Similarly, American intelligence organizations have traditionally depended on for-profit corporations to help them collect signals and communications data (Cohen 2010). For practical reasons, some degree of partnership between corporations and U.S. government organizations responsible for national security is essential. Outsourcing certain non-combat responsibilities and procuring industrial inputs from external suppliers permits intelligence agencies and the armed forces to focus on their core responsibilities and to seek assistance via contracting in those areas that involve a high level of technological competence, in non-essential service areas such as basic IT support and custodial work, or in cases where personnel shortfalls arise (Franck and Melese 2008).⁶

Some degree of outsourcing by defense and intelligence agencies is necessary. Still, contractors' considerable involvement in the Iraq War, the War in Afghanistan, and numerous other post 9–11 counterterrorism operations has prompted analysts to note the growing corporatization of the U.S. defense landscape and the encroachment of companies into areas once deemed the sole province of the government (Avant and de Nevers 2011). In the conflicts in Iraq and Afghanistan, for instance, personnel employed in-country by contractors often outnumbered members of the regular U.S. military (Peters, Schwartz, and Kapp 2017). Although contractors were rarely involved in direct combat operations – and therefore not considered mercenaries under international law – employees of these companies engaged in protection services, assisted in special operations missions, and interrogated high-value detainees. In recent years, even the controversial practice of drone piloting has been outsourced (Schmidt 2016). Meanwhile, cyber operations are increasingly being handled by corporations that can pay top-dollar to hire engineers and programmers (Maurer 2017).

Several factors account for the U.S.' increased use of contractors. P.W. Singer argues that cuts in defense spending following the Cold War, the growing operational importance of technology rather than raw force size, and the widespread internalization of neoliberal economic norms, have all contributed to greater outsourcing (Singer 2003). In addition, scholars including Anna Leander and Allison Stanger have noted that large defense corporations may use their considerable economic resources to influence government demand for goods and services by lobbying elected officials and contributing to political campaigns (Leander 2005; Stanger 2009). Additionally, the trend towards outsourcing may create a self-reinforcing cycle of path dependence in which the military may lose the ability to carry out certain vital national defense responsibilities and subsequently becomes reliant on companies (Mahoney 2017).

In the U.S. defense industry, contractors operate in a variety of sectors including aerospace, weapons systems production, logistics, protection services, security force training, cybersecurity, and intelligence collection and analysis.⁷ Within the sizeable population of U.S. defense contractors, government agencies work with both publicly traded corporations and privately owned companies. Between these two types of organizations, publicly traded corporations account for the bulk of U.S. spending on defense outsourcing. In 2017 – among the top 100 contractors by total dollars awarded – the U.S. Army, Navy, and Air Force spent 83 percent of their combined contracting budget on publicly traded corporations (General Services Administration 2017).⁸ Demonstrating the dominance of the largest corporations in the industry, the share of defense contract spending awarded to the top five publicly traded contractors has risen from 21.7 percent in 1990 to 35 percent in 2017 (Masunaga 2019).

Moreover, a significant percentage of many major U.S. defense contractors' revenues comes from government awards. For example, General Dynamics, Leidos, and L3Harris Technologies – all publicly traded corporations with market capitalizations over \$20 billion – each garner between 40 to 60 percent of their annual revenue from government contracts (Bloomberg Government 2018). Some large defense contractors, including Lockheed Martin and Booz Allen

Hamilton, earn over 90 percent of their revenues from the U.S. government. Because government agencies are the primary buyer of goods and services produced by major American defense contractors, the U.S. defense industry is often characterized as a monopsony – a marketplace with one major buyer and numerous sellers (Kovacic and Smallwood 1994; McFate 2014). In this type of market, it is challenging for corporations to grow meaningfully by increasing their customer base, and they must instead seek to gain market share through mergers and acquisitions.

In addition to receiving the majority of U.S. government funds spent on defense, in recent years publicly traded contractors have realized significant financial growth. From 2012–2017, total revenues of the 100 largest publicly traded defense and aerospace corporations increased by 15 percent, totaling \$685.6 billion in 2017 (Deloitte 2018).⁹ Operating profit for these corporations over the same period increased by 27 percent to \$74.2 billion, with profit margins reaching 10.8 percent in 2017 (Deloitte 2018). Revenues of the largest twenty companies totaled \$504.6 billion in 2017 – or 73 percent of all industry revenues.

The share prices of many major publicly traded defense contractors have also performed well in financial markets over recent years. Based on their collective stock prices, publicly traded corporations in the defense industry have grown almost twice as fast as the broader U.S. stock market over the previous five years. From 2013–2018, the value of defense contractor stocks making up the S&P Aerospace and Defense Exchange Traded Fund increased by 157 percent, outperforming the Standard and Poor's 500 Index – widely considered the most accurate barometer of overall American stock market performance – by 87 percent.¹⁰ In general, forward-looking projections regarding the defense industry made by analysts and major financial institutions are upbeat. For example, a set of industry analysts polled by the financial data company FactSet estimated that in 2020 earnings per share for companies in the sector will increase by 14.9 percent over present levels, outperforming the S&P 500 index by 5 percent (van Doorn 2018). Similarly, global financial advisory firm Deloitte predicts that heightened geopolitical security risks coupled with a rising U.S. defense budget are expected to fuel robust growth in the defense sector in upcoming years (Deloitte 2019). Additionally, because the industry generally is characterized by high barriers to entry, large defense contractors in the U.S. face limited competition (Standard and Poors 2017). Major defense companies are also partially shielded from the effects of cyclical economic downturns because their primary source of revenue is U.S. government defense spending, which is unlikely to decrease significantly in the near future (Standard and Poors 2017).

Although publicly traded contractors presently dominate the American defense industry, little academic research has specifically examined this class of company. Therefore, relatively little is known about how these firms use their corporate structure to advance their financial interests. The subsequent section of this inquiry identifies a set of financial strategies that publicly traded defense corporations use to raise capital in order to make strategic acquisitions, in this way reducing competition and gaining market share in the industry.

Publicly Traded Contractors and U.S. Defense Industry Consolidation

In any market, corporate expansion can occur in one of two ways: organic growth that takes place through customer expansion, new product development, and increased output; or mergers and acquisitions in which companies grow by buying or combining with competitors to increase their size and market share. In the U.S. defense industry, where much of the demand comes from a single buyer – the federal government – organic growth is difficult because customer expansion is a challenge, and demand is dependent on broader budgetary concerns. Due to this market feature, company expansion in the American defense industry largely occurs through acquisitions. Because acquisitions are facilitated when companies have surplus capital, publicly traded corporations enjoy a distinct advantage to privately owned

companies. Specifically, three financial strategies – IPOs, follow-on share offerings, and preferential access to debt – give publicly traded corporations superior capacity to raise capital and therefore greater ability to execute strategic acquisitions.

Initial Public Offerings

IPOs occur when companies make their ownership shares available for purchase on public stock exchanges for the first time. By offering shares to the public, corporations can raise capital without incurring debt. When a company ‘goes public’ the funds paid for shares by investors, which often initially include large financial institutions, go directly to the issuing corporation and can be used to spur additional growth. In addition to providing corporations with liquidity, IPOs are often accompanied by extensive public relations campaigns on Wall Street and in other global financial centers. These ‘roadshows’ introduce the corporations floating stock to major financial institutions. Connections made between companies and financial institutions during the IPO process are important in the future if companies seek debt financing from major lenders.

Unlike publicly traded corporations, privately owned companies do not offer ownership shares for sale on public exchanges. While it is possible for privately owned firms to sell ownership stakes to individual or institutional investors, it is difficult for these companies to raise equivalent levels of capital to that which can be obtained in the IPO process. That is, the shares of privately owned companies often trade at a significant discount to the price they would receive in public markets (Paglia and Harjoto 2010; Block 2007; Kooli, Kortas, and L’Her 2003; Koeplin, Sarin, and Shapiro 2000). For this reason, two companies of roughly equal size and quality – one private, one public – will raise meaningfully different amounts if they decide to sell portions of their ownership shares to raise funds in order to spur growth. Put simply, publicly traded corporations can accrue significantly more capital from their equity than comparable privately owned companies.¹¹

In the U.S. defense industry, IPOs are often used to raise funds in order to make strategic acquisitions and pay down existing debt. Table 1 lists major defense industry IPOs for the period 1999–2019. In one case, in 2006 Sciences Applications International Corporation (SAIC) – a contractor that provides IT services to the U.S. intelligence community – raised more than \$1.1 billion dollars through an IPO that was underwritten by Morgan Stanley and Bear Stearns.

Table 1. Defense industry IPOs, 1999–2019.

Year	Company	Funds Raised	Current Company Status
1999	Kratos	\$60,000,000	\$2.59 billion market capitalization
2002	Anteon	\$270,000,000	Acquired by GD for \$2.2 billion in 2005
2002	ManTech	\$115,000,000	\$2.72 billion market capitalization
2002	SRA International	\$90,000,000	Acquired by Providence for \$1.88 billion in 2011
2002	SI International	\$60,900,000	Acquired by Serco for \$422 million in 2008
2002	Veridian	\$216,000,000	Acquired by GD for \$1.5 billion in 2003
2003	Digitalnet	\$85,000,000	Acquired by BAE for \$600 million in 2004
2005	NCI Inc.	\$54,000,000	Acquired by H.I.G. Capital for \$283 million in 2017
2006	Dyncorp	\$375,000,000	Acquired by Cerberus for \$1 billion in 2010
2006	ICF International	\$56,000,000	\$1.56 Billion market capitalization
2006	SAIC (now Leidos) ^a	\$1,100,000,000	\$11.89 Billion market capitalization
2006	Stanley Inc.	\$81,900,000	Acquired by CGI Group for \$1.07 billion in 2010
2007	KBR	\$473,000,000	\$3.72 billion market capitalization
2007	ICX Technologies	\$80,000,000	Acquired by FLIR for \$268 million in 2010
2009	GDTS	\$40,000,000	Acquired by Ares Capital for \$222 million in 2011
2009	Sotera	\$59,800,000	Acquired by KeyW for \$235 million in 2017
2010	KeyW	\$90,000,000	Acquired by Jacobs for \$815 million in 2019
2010	Booz Allen	\$252,000,000	\$9.69 billion market capitalization
2012	Carlyle Group	\$671,000,000	\$8.51 billion market capitalization
2013	FireEye	\$303,500,000	\$3.4 billion market capitalization
2019	Parsons	\$500,000,000	\$3.70 billion market capitalization

^aIn 2013, SAIC changed its name to Leidos and spun-off a new company that retained the SAIC name.

On the day the stock went public, chief executive officer Kenneth Dahlberg rang the opening bell on the New York Stock Exchange. When asked about why the company chose to go public, Dahlberg answered: 'in order for us to continue to grow ... The industry will be consolidating, and we want to be a consolidator' (Witte 2006). Dahlberg added: 'Post-IPO we'll have the firepower to do the larger acquisitions – \$200 million, \$500 million, and even up to billion-dollar companies.' In the years following its IPO, SAIC acquired dozens of companies in order to expand the range of services it could offer to government defense agencies. Table 1 lists major IPOs in the U.S. defense industry over the previous twenty years.

Follow-On Share Offerings

After IPOs take place, publicly traded corporations can raise additional capital by selling shares through follow-on offers. When companies go public, they typically retain a significant percentage of their shares that do not float on exchanges. Shares not made available for sale at the time of an IPO can subsequently be sold if companies need to raise cash. Proceeds from follow-on offerings can be used for several purposes including servicing debt, research and development, and acquisitions. Unlike publicly owned defense contractors, privately owned companies cannot access exchanges to raise additional funds. If private contractors want to use their equity to raise capital for business expansion, they must do so from institutional sources, private equity firms, or wealthy individuals, often selling shares at a significant discount to what could be received on public exchanges.

Publicly traded defense contractors often use follow-on share offerings to spur growth. For example, in 2017 Kratos Defense and Security Solutions – a company that develops drones for the DoD and is listed on the NASDAQ stock exchange – raised \$162 million dollars through a follow-on sale (Kratos 2017). In Kratos' press release, the company stated that funds raised from the sale of shares would be used to assist with 'production on under contract programs and expected to be received new contracts and programs.' Kratos additionally stated the company would use the offering to 'reduce its indebtedness ... and for general corporate purposes, including potential acquisitions' (Kratos 2017). This was not the first time that Kratos engaged in a follow-on sale. In 2011, the company raised \$56 million dollars through an offering underwritten by Jefferies Group, a New York based investment bank. In the year following that offering, Kratos acquired Integral Systems and SecureInfo, two companies that added key capabilities to Kratos' service portfolio.

Preferential Access to Financing

Debt is an important financial tool defense contractors use to fund activities, carry out new research and development, and spur growth. While debt is often viewed as an indicator of risk, it can be employed strategically by corporations seeking to grow rapidly through acquisitions. In these transactions, corporations typically use a combination of their own equity and debt to purchase smaller competitors. Following the end of the Cold War, acquisitions largely funded by debt increased markedly in the U.S. defense industry as corporations sought to grow in order to survive major decreases in government defense spending (Lehman and Brooks 2000). In recent years, as consolidation has become a key goal for many major defense contractors, debt-to-equity ratios across the industry have risen to an average of 26.7 percent in 2017, up from 18.6 percent in 2013 and 15 percent in 2004 (Aeroweb 2017).

When raising capital through debt financing, publicly traded corporations possess distinct advantages over privately owned companies. Because publicly owned corporations are regulated by the Securities and Exchange Commission (SEC), they must be highly transparent in their financial disclosures. This makes it easier for lending institutions to evaluate their financial status, improving the odds that these corporations will be approved for financing with favorable terms. Additionally, through the IPO process – and the cachet of being an exchange listed corporation – publicly traded corporations develop ties to capital markets, private equity firms,

investment banks, and other financial institutions, making it easier for them to access debt (Pagano, Panetta, and Zingales 1998; Schenone 2010; Saunders and Steffen 2011; Phillips and Sertsios 2017). Unlike publicly traded corporations, private companies' finances are often less transparent and receive less scrutiny from analysts. This increases the risk that lenders face when issuing debt to private firms and may affect the conditions and lending rates under which such companies can borrow.

In the American defense market, financing is central to contractors' consolidation efforts. For instance, in 2018 General Dynamics – a major provider of aerospace technology and hardware to the DoD – completed an acquisition of defense IT services company CSRA. The acquisition represented a strategic push by General Dynamics to become the leading contractor in the rapidly growing cybersecurity sector in advance of the Trump administration's plans to implement a major defense spending increase. Specifically, General Dynamics believed it needed to purchase CSRA to compete against defense IT contractor Leidos for upcoming DoD cybersecurity contracts. At the time of the acquisition, General Dynamics was the sixth largest military contractor in the U.S. with \$19.6 billion in annual revenue earned from defense related services. While General Dynamics' size did not make an acquisition of CSRA unreasonable, \$2.8 billion of the company's \$9.6 billion bid for CSRA was projected to be financed by new debt (Gregg 2018).

General Dynamics' efforts to move into the cybersecurity field caused serious apprehension among smaller companies in the sector, which feared the potential disruption the acquisition might cause to their future business. Notably, following General Dynamics' initial bid for CSRA, CACI – a defense contractor specializing in defense IT services – made a counteroffer at 8 percent above General Dynamics' initial bid. CACI's offer for CSRA was surprising given that CSRA was larger than CACI while General Dynamics was nearly seventeen times CACI's size as measured by market capitalization. Because of these factors, CACI's bid involved a plan that would use a combination of debt and its own stock to purchase CSRA. Analysts assessing CACI's bid noted that if the acquisition was completed it would add nearly \$6 billion of new debt to CACI's balance sheet, which would represent approximately five times the company's annual earnings (Black 2018). Ultimately, CACI withdrew its bid when it became apparent that CSRA's board of directors favored being acquired by General Dynamics; however, CACI's ability to access a loan greater than its total market capitalization demonstrates both the important financial ties publicly traded defense contractors have with major lending institutions and companies' willingness to take on significant financial liabilities in order to grow.

Research Design

Consolidation in the U.S. defense industry since the end of the Cold War is a well-documented phenomenon (Markusen 1997; Hensel 2010; Duggan and Carril 2018; Gregg 2019a). This inquiry's objective is not to review that consolidation, but rather to determine the processes through which industry concentration and corporate growth have occurred. Previous work on American contractors has largely argued that political factors including campaign donations, lobbying, and the 'revolving door' between government and the corporate world are responsible for companies' subsequent growth (Karpoff, Lee, and Vendrzyk 1999; Witko 2011). This study demonstrates that the financial strategies corporations in the defense industry use to consolidate also are an essential factor in their long-term performance. To support this argument, the inquiry highlights three causal mechanisms (Beach and Pedersen 2013; Bennett and Checkel 2015) that link ownership structure with corporate growth in the U.S. defense industry: IPOs, follow-on share sales, and preferential access to debt. The identification of these mechanisms as a means of company growth and industry consolidation is an important contribution to the literature on U.S. defense outsourcing.

Two cases study methods are used to test the viability of the inquiry's central argument – namely, that publicly traded defense contractors can raise capital more efficiently than privately owned

contractors and often use this additional liquidity to increase their size and market share via acquisitions.¹² First, a within-case comparison (George and Bennett 2005, 166–167; Beach and Pedersen 2013, 74–76) of a single defense contractor – ManTech International Corporation – before and after its IPO evaluates the company’s growth when it was first privately owned and later publicly traded.¹³ Using this approach, a number of external factors are held constant while only ManTech’s ownership structure varies. ManTech’s financial performance is measured by tracking changes in two indicators: revenue and market capitalization during the years before and after its IPO.¹⁴

Second, while within-case variation permits control of many confounding factors that may influence corporate performance, it also raises the problem of selection bias. That is, companies that elect to go public may already be primed for success. If that is true, it may not be public ownership that matters, but rather the inherent characteristics of a corporation that result in subsequent growth. To address this possibility, a most-similar comparison across cases (Gerring 2017, 79–117) is also employed to test the inquiry’s main hypothesis. Using this approach, the financial performance of ManTech International and STG Incorporated – defense contractors of similar size and operating in the same service sector over the same period – were compared, with the major difference being that ManTech went public and STG remained privately owned. Changes in revenue and market capitalization for each organization were assessed to determine if public ownership resulted in faster growth for one company.

Case Selection

ManTech was chosen as an illustrative case for several reasons. First, examining a recent transition from a privately owned company to a publicly traded corporation is an ideal way to assess the within-case causal influence (Goertz 2017, 29–57) of varying corporate ownership structure on growth. Second, among contractors in the defense industry that have had their IPO in the last twenty years (see Table 1), ManTech serves as a typical case in terms of company size as measured by IPO funds raised. ManTech’s \$115 million IPO ranks it tenth out of twenty-one defense contractors that went public during this period. ManTech is therefore unlikely to be an instance of an extremely strong company primed for rapid growth or a weaker company going public solely to raise funds to pay off debt obligations. Third, the considerable period ManTech spent as both a private and publicly owned corporation allows for a reliable assessment of the company’s financial performance over time. By contrast, evaluating a company with significantly less time as either a private or public corporation could bias observations due to changes in U.S. defense spending cycles or short-term anomalous factors.

STG was selected as a most-similar case to ManTech because of the companies’ comparable sizes and industry status in the early 2000s, overlapping areas of service specialization, and coinciding periods in which they operated. When compared with ManTech, STG represents a control case. That is, the two companies exhibit different values on ownership structure with ManTech experiencing the effect of going public.¹⁵ The two companies also display subsequent variation on revenue growth and market capitalization. Furthermore, because both companies operated in the same service areas and are examined over the same time period, structural economic factors affecting the broad defense IT market are held constant. Finally, both companies were part of the mid-tier defense IT contracting market in terms of contract dollars awarded in the early 2000s when ManTech went public (Washington Technology 2002).

Acquire or Expire: ManTech International and STG Incorporated

This section compares ManTech International and STG Incorporated. The first case study evaluates ManTech using a within-case comparison before and after the company’s IPO in 2002. Prior to its IPO, ManTech grew slowly but steadily; however, after going public the firm made dozens of major acquisitions transforming itself into a billion-dollar company as measured by both revenue and

market capitalization. This within-case assessment thus possesses variation on the causal factor of interest – ownership structure – and its effect on corporate size, and also identifies the presence of the inquiry’s key causal mechanisms: namely, capital raised through an IPO, follow-on share sales, and debt used for the purpose of making strategic acquisitions.

The second case study uses a most-similar design to compare ManTech’s performance as a publicly traded company with STG Incorporated, a privately owned firm. Like ManTech, STG grew at a steady pace from its formation in 1986 through 2002. However, in the mid 2000s, STG remained privately held while ManTech expanded its capabilities and scale through strategic acquisitions funded by capital provided by lenders and through its IPO. Although STG’s executives also wanted to grow by making acquisitions, the company struggled to access sufficient funds to make purchases and was unable to consolidate to the same extent as ManTech. STG’s inability to grow via acquisitions eventually caused the company to become less competitive, resulting in declining annual revenues. Ultimately, after a failed acquisition attempt in 2018, STG was seized by its creditors and sold. [Figure 1](#) compares annual contracting dollars awarded to ManTech and STG from 2002–2018.

ManTech International Corporation

ManTech International is a publicly traded American defense contractor specializing in cybersecurity, information technology services, intelligence analysis, and military operations support. In 2017, the company had a market capitalization of \$2.38 billion and revenue of \$1.7 billion, with approximately 85 percent of its income coming from work for the U.S. government (Defense News 2017; Bloomberg Government 2018). ManTech’s rapid growth between 2002–2018 coincides with a period in which the company had an initial public offering on the NASDAQ stock exchange and subsequently made use of cash on hand and debt to acquire twenty-one companies – many of them worth hundreds of millions of dollars – in order to become more competitive in the industry. As ManTech’s founder and former CEO George Pedersen noted in a 2006 interview: ‘acquisitions have been an important part of our growth strategy since we went public in 2002’ (Hubler 2011). [Table 2](#) lists ManTech’s major acquisitions following its IPO.

Table 2. ManTech International Corporation acquisitions, 2002–2019.

Year	Firm Acquired	Field	Cost of Acquisition
2002	CTX Corporation	Intelligence IT	\$34 million
2002	Aegis Research	Defense IT	\$69 million
2005	Gray Hawk Systems	Intelligence IT	\$100 million
2007	SRS Technologies	Defense IT	\$195 million
2007	McDonald Bradley	Defense IT	\$76.5 million
2008	Evolvent Technologies Group	Healthcare IT	Undisclosed
2008	EWA Services	Defense IT	Undisclosed
2009	Sensor Technologies Inc.	Defense IT	\$242 million
2009	DDK	Cybersecurity	Undisclosed
2010	MTCSC	Defense IT	\$75 million
2010	WINS	Defense IT	\$90 million
2010	QinetiQ	Intelligence IT	\$60 million
2011	Trantech Inc.	Cybersecurity	\$22 million
2012	HBGary Inc.	Cybersecurity	Undisclosed
2013	Alta Systems	Healthcare IT	Undisclosed
2014	7Delta	Healthcare IT	Undisclosed
2015	Knowledge Consulting Group	Cybersecurity	Undisclosed
2015	Welkin Associates	Defense IT	\$34 million
2016	Edaptive Systems	Healthcare IT	Undisclosed
2016	Ocean’s Edge	Cybersecurity	Undisclosed
2017	InfoZen	Defense IT	\$180 million
2019	KForce	Defense IT	\$115 million

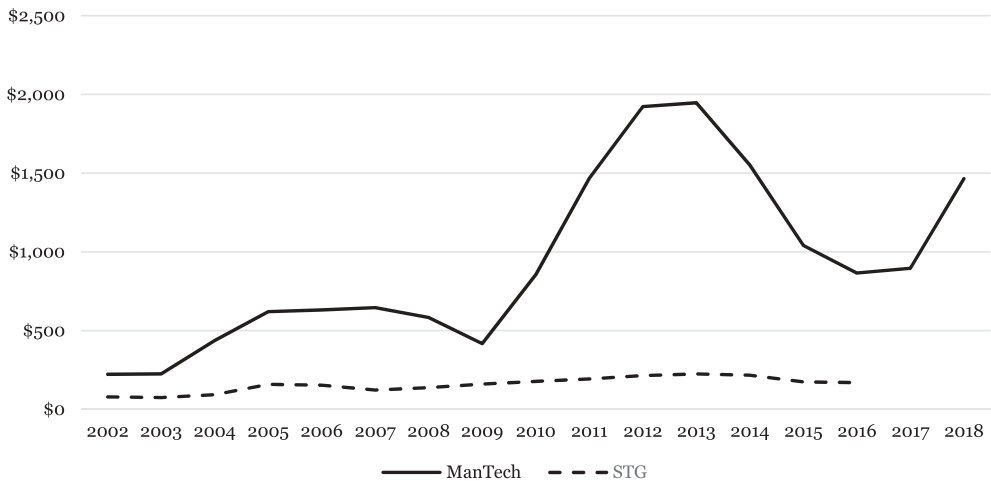


Figure 1. ManTech and STG Annual Contract Awards (US \$ Millions).

ManTech formed in New Jersey in 1968. In its early years, the company developed submarine wargame simulations for the Navy. By 1976, the firm had moved its headquarters to Alexandria, VA – not far from the Pentagon – and shortly thereafter began working with U.S. intelligence agencies in addition to the DoD. Although a relatively minor player in the defense services sector at the time, ManTech executives viewed strategic acquisitions as an essential mechanism for survival and growth even in the company’s early years (Sugawara 1988). However, because ManTech was not a large company, in the decades following its formation its acquisitions were limited to distressed firms that possessed valuable intellectual property or small corporations that already had relationships with government agencies in areas where ManTech sought to make inroads (Sugawara 1988).

By 2000, ManTech’s income from government contracts had reached \$222 million; however, the company remained a relatively peripheral actor in the industry. ManTech’s rapid growth into a billion dollar company over the next several years was spurred by its 2002 IPO and subsequent follow-on share offering – both underwritten by investment bank Jefferies and Company – which raised a combined \$225 million. The IPO positioned ManTech to acquire numerous multimillion-dollar competitors at a time when U.S. defense spending was increasing rapidly in response to growing homeland security concerns and the escalating wars in Iraq and Afghanistan. When asked about going public, CEO Pedersen stated: ‘I didn’t really want to do that ... but the logic was overwhelming. And it really was the right decision’ (Hayes 2006).

ManTech’s first two acquisitions following its IPO and secondary offering were the \$34 million purchase of CTX Corporation, a provider of software and information technology services to the U.S. intelligence community, and the \$69 million acquisition of Aegis Research, a firm providing IT services to the National Reconnaissance Office (McCarthy 2002). ManTech’s next major acquisition took place in 2005 when it bought Gray Hawk Systems for \$100 million in a deal that was partially funded by accessing a senior credit facility – a type of debt instrument provided to corporations by major financial institutions (Defense Industry Daily 2005). The Gray Hawk purchase added counter-terrorism mission support capabilities to ManTech’s areas of specialization. Upon announcement of the deal, CEO Pedersen stated: ‘this acquisition is consistent with ManTech’s growth strategy in the high-end intelligence, homeland security, and defense markets ... [the acquisition] positions us to reach the \$1 billion revenue mark in the near future’ (Gerin 2005). Pedersen’s prediction was correct. ManTech’s total revenue more than doubled from \$400 million in 2002 to \$1 billion by 2006, just four years after the company went public (Hayes 2006).

Although ManTech reached \$1 billion in revenue by 2006, it continued to seek out new acquisition targets in order to expand its capabilities and enhance its competitiveness. From 2007–2009, the company purchased SRS Technologies for \$195 million, McDonald Bradley Inc. for \$76.5 million, Sensor Technologies Inc. for \$242 million, and Electronic Warfare Associates and DDK Technology Group Inc. for smaller undisclosed sums. To fund these acquisitions, ManTech accessed \$170 million in debt available from a \$300 million senior credit facility (Business Wire 2007). Therefore, ManTech took on considerable liabilities to grow its business, calculating that the risk of accruing debt was less than that of falling behind its rivals in the industry.

During the early years of the Obama administration, ManTech continued its strategy of purchasing rising companies in the defense IT and cybersecurity sectors by buying MTCSC for \$75 million, Worldwide Information Network System for \$90 million, and TranTech Inc. for \$22 million. Upon announcement of these acquisitions, Pedersen affirmed the company's core approach to growth: 'ManTech has a consistent strategy of acquiring companies' (Business Wire 2011). To raise capital for these purchases, as well as to pay down expiring debt, ManTech assumed \$200 million in new liabilities through issuing senior unsecured notes purchased by 'qualified institutional buyers' that were guaranteed a fixed income return of 7.25 percent (ManTech 2010). That is, to raise capital for these acquisitions ManTech created a class of corporate debt that was sold to major financial institutions. This new debt was also partially used to pay down funds ManTech had borrowed to make previous acquisitions.

After the election of Donald Trump in 2016, U.S. defense contractors anticipated significant spending increases on national security. With the likelihood that a considerable portion of these budget outlays would go to companies working in the rapidly growing field of cybersecurity, ManTech continued its strategy of growth through acquisition. In 2017, the company announced it would purchase cloud security specialist InfoZen for \$180 million by using both cash on hand and financing from its credit facility. The acquisition gave ManTech a larger foothold in the Department of Homeland Security, one of InfoZen's major clients (Wicker 2017). This period also saw a host of new contract awards for ManTech. Most notably, in 2018 – following the end of the budget sequester and a ten percent increase in defense spending signed into law by President Trump – ManTech was awarded a \$959 million contract with the National Security Agency and a \$130 million contract with the Army Intelligence and Security Command (Wilkers 2018b).

To summarize, following its IPO in 2002 ManTech International began an ambitious sequence of acquisitions that enabled the company to grow and secure consistent business from intelligence agencies and the DoD. ManTech's IPO did not mark the beginning of its efforts at consolidation; however, capital obtained by going public, along with significant credit made available by financial institutions after its IPO, allowed ManTech to grow into a billion-dollar company. ManTech's executives sought corporate growth in order to ensure the company's status and long-term survival in a rapidly consolidating industry. As CEO Pedersen noted in a 2005 interview: 'you have the very major corporations – Lockheed, Northrop Grumman ... and then you have the billion-dollar corporations, and then you have everyone else. So, our target was to get to the billion dollars ... for position in the industry.' (Robinson 2005).

Using capital raised from its IPO and follow-on offering, a \$350–\$500 million line of credit, and at least \$200 million in unsecured debt, ManTech acquired twenty-one companies between 2002–2019. During this period, the company's revenue increased by over four-hundred percent. Simultaneously, the market capitalization of the company's stock rose to over \$2 billion. ManTech's acquisition-fueled growth during the 2000s transformed the company into a major contractor in the cybersecurity and defense IT sectors, allowing it to withstand significant cuts in defense spending that occurred as a result of the 2013 budget sequester and troop drawdowns in Iraq and Afghanistan. By buying rival companies in the industry, ManTech reduced competition while simultaneously assimilating additional service capabilities, making it more likely that the company would win lucrative contracts with a wide number of government organizations. In this way, the company ensured that its future did not depend on a small number of awards or a single defense

agency. Presently, while ManTech is not a company on the scale of General Dynamics or Raytheon, it resides in the ranks of corporations with market capitalizations between \$2 billion and \$10 billion that provide IT defense services, military and intelligence operational support, and technical cybersecurity expertise to a broad swath of government agencies. Along with similar publicly traded contractors such as Leidos, SAIC, and CACI, ManTech is embedded throughout the American security architecture and thus forms part of a class of corporations on which the U.S. government depends to carry out vital aspects of national defense.

STG Incorporated

STG Incorporated was a privately owned defense contractor based in Reston, Virginia, specializing in cybersecurity, software development, and data analysis for numerous federal agencies including the Navy, State Department, and Department of Homeland Security.¹⁶ The company formed in 1986 with just 25 employees and grew rapidly over the next fifteen years to become one of the top small IT contractors in the defense sector. However, while rivals like ManTech and SAIC went public in the mid-2000s and subsequently went on acquisition sprees as U.S. defense spending soared to support the wars in Iraq and Afghanistan, STG remained a privately held company and struggled to grow, especially when the budget sequester froze defense spending. Between 2005–2015, STG's revenue remained stagnant, increasing just 7 percent from \$159 million to \$171 million (Washington Technology 2015). Unable to compete with larger rivals and burdened by a heavy debt load, in 2018 STG was acquired for \$83 million by rival SOS International after STG's creditors had taken control of the struggling company.

For the first two decades of its existence, STG was a successful defense IT services firm earning approximately 90 percent of its revenue from the U.S. government. At its peak in the early 2000s, the company had over 2,000 employees and contracts with up to fifty federal agencies (Socha 2000). During its early years, STG benefitted from its status as a small business, competing for government awards exclusively available to developing companies. However, by 2001 STG was no longer eligible for small business status and began to vie for contracts on the open market against larger corporations.

STG's executives recognized that to be competitive the company would have to grow by making acquisitions, and in 2002 STG purchased three firms: Decision Systems Technologies Inc., International Computers and Telecommunications, and PSC Inc. Each of these acquisitions would position STG to take advantage of expected defense spending increases associated with counterterrorism operations after the 9–11 terrorist attacks. To finance these deals STG issued seller notes rather than borrowing from large institutional lenders (Walt 2002). Seller notes are a debt instrument typically used when a company lacks sufficient capital to complete an acquisition and thus self-finances a deal by guaranteeing to repay the instrument's holder – in this case the shareholders of companies being acquired – in a series of installments. Because seller notes are considered a form of unsecured debt and have greater risk than so-called senior debt, they often carry generally high rates of interest and are often considered an option of last resort. Therefore, unlike ManTech, which was able to raise capital and fund growth through an IPO, follow-on stock sales, and loans from large financial institutions, STG funded its acquisitions through less efficient means. After this series of purchases, STG never made another major acquisition.

Although STG lacked sufficient capital to consolidate on the scale of its competitors, the company was able to secure consistent business from the U.S. government as defense spending increased during the administration of George W. Bush. For instance, from 2005–2008 STG won three awards to provide IT communications and data security services to the Army. However, after 2008 STG struggled to increase its revenue as the global financial crisis put pressure on the U.S. defense budget and the administration of President Barack Obama came into office promising to end the wars in Iraq and Afghanistan. As a privately owned, mid-tier contractor anticipating

years of defense drawdowns, the company began to confront concerns about its competitiveness against increasingly larger rivals.

By 2008, STG's executives had begun to consider going public in order to fund a series of new acquisitions (Gregg 2015). However, the company encountered three major obstacles that caused this transition to be delayed. First, the Great Recession had rattled investor confidence in stock markets. The depressed price of stocks as well as a liquidity crisis among American banks meant that IPOs were neither as attractive financially nor as feasible as they would have been during a period of more robust economic growth. Put simply, were STG to have gone public during the financial crisis, the funds it could have raised through an IPO would likely have been less than in an IPO between 2002–2007. Second, although STG was an established defense contractor by 2008, the estimated size of its IPO was relatively low, making it a less attractive underwriting option for institutional investment banks during a period of economic slowdown. Finally, the 2013 budget sequestration meant that there would be fewer awards for defense contractors in upcoming years. In this challenging business climate, STG could not find the right deal to go public.

Unable to arrange an IPO underwritten by a major investment bank, in 2015 STG was purchased by a special purpose acquisition corporation, a type of shell company that itself raises cash through an IPO and then uses that capital to buy companies. In this case, the acquiring corporation – Global Defense and National Security Systems Inc. (GDEF) – purchased STG for \$165.5 million and retained the STG name, employees, and most members of its senior management. This transaction technically made STG a publicly traded company; however, because STG was acquired and therefore did not have an IPO, the company did not receive the initial cash infusion corporations normally experience when they begin trading on exchanges. STG's executives remained largely in control of the company, viewing the deal with GDEF as a means to spur growth and to connect STG to larger financial interests, thus potentially enabling a series of new acquisitions. Following the merger, a GDEF executive noted 'we're already looking at the next acquisition, which will take place once the deal [with STG] closes' (Gregg 2015).

While STG's executives believed its acquisition by GDEF would be the beginning of a wave of consolidation, the deal instead resulted in a host of financial problems that would land STG on the brink of bankruptcy. In early 2017, STG announced its intention to acquire Preferred Systems Solutions, a provider of cybersecurity services to several intelligence agencies, for \$119 million (Wakeman 2017a). However, by May 2017, the acquisition had not been finalized and according to filings with the SEC, STG had not been able to find financing to complete the deal (Wakeman 2017b). STG's SEC disclosures further revealed that its revenue was in decline and that the company was in non-compliance with its current debt obligations. By July 2017, STG's financial position had become increasingly untenable and the acquisition was cancelled. In November 2017, STG was seized by its primary creditor, which ultimately sold STG to defense contractor SOS International for \$83 million in early 2018 (Wilkers 2018a).

To summarize, when contrasted with ManTech's financial growth over the same period, STG's stagnation and decline can largely be explained by its inability to go public and the resulting lack of capital for the company to make strategic acquisitions. After emerging from protected small business status in 2001, STG's executives understood that to be competitive the company needed to buy additional firms in the defense IT sector (Gregg 2015). However, after an initial wave of acquisitions in 2002, STG's growth stalled. Unlike ManTech, which raised \$225 million through an IPO and follow-on offering and had significant credit available for acquisitions from major financial institutions, STG remained private and struggled to raise sufficient funds for acquisitions through its business activities alone. Thus, as ManTech diversified and grew its business by purchasing twenty-one companies, STG struggled to increase its revenue and customer base. As larger rivals like ManTech, SAIC, and CACI, grew through consolidation, STG could no longer compete with these corporations on scale, and suffered during a period of defense drawdowns due to budget sequestration. Even when STG technically became a public corporation after being acquired by GDEF, lack of an IPO meant that STG neither received an influx of capital nor formed important

network ties with major financial institutions that typically accompany the IPO underwriting processes. Unable to make acquisitions, STG's revenues declined as it became increasingly less competitive than its larger, publicly traded rivals. Ultimately, after an internal financial crisis the company was acquired by SOS International in 2018.

Conclusion

In recent decades the U.S. has become increasingly dependent on for-profit corporations to carry out vital security operations. Although contractors have traditionally played a role in supporting U.S. armed forces and intelligence agencies, presently much of the public good of providing for American national defense is outsourced to companies with corporate structures that prioritize shareholders' interests and short-term financial performance. Furthermore, due to market characteristics of the U.S. defense sector – namely, that government agencies are the major buyers of goods and services in the industry – corporations have aggressively pursued consolidation to reduce competition and to ensure a steady stream of contract awards. As SAIC's CEO Nazzic Keene said in a recent interview with *The Washington Post* after the company's \$2.5 billion acquisition of Engility Corporation: 'the only insurance you get [in the defense industry] is to be as big as possible' (Gregg 2019b).

This study has described how publicly traded corporations have come to dominate the American defense industry and has demonstrated that in addition to lobbying and campaign contributions, publicly traded defense contractors use a set of financial strategies – including IPOs, follow-on share offerings, and debt financing – to grow by making strategic acquisitions. Each of these practices permits publicly traded defense corporations to raise capital more efficiently than their privately owned rivals. In an industry where growth largely occurs through acquisitions, use of these strategies has permitted publicly traded corporations not only to reduce competition but also to gain ownership of valuable intellectual property and technology.

Finally, this inquiry raises two additional questions for future research. First, while a certain level of cooperation between defense contractors and U.S. government agencies is to be expected, the current state of affairs – in which several large, publicly traded corporations have become indispensable to American defense operations – raises concerns about potential financial threats to these companies. In strong economic climates and in periods when there are increases in defense spending, publicly traded defense contractors stand to make a windfall; however, these same companies may face severe pressures in times of economic downturn. Although the U.S. government is presently increasing spending on national defense, the rising national debt and the eventuality of an economic recession may result in future pressure on defense stocks.

Second, although publicly traded contractors presently hold a dominant position in the American defense industry, in recent years private equity firms have become increasingly active in the defense sector. After purchasing a company, private equity firms will often use debt – borrowed against the acquired company's assets – to restructure the company with the intention of reselling it or taking it public via an IPO. This process often results in high rates of return for private equity firms but can sometimes burden acquired companies with debilitating credit obligations. In recent years, private equity firms including The Carlyle Group, Kholberg Kravis Roberts, Veritas Capital, and Cerberus Capital Management, have made significant investments in defense contractors. By some estimates, over the previous five years private equity firms have been responsible for 40 percent of the acquisitions in the sector (De Santo 2018). Unlike privately owned defense contractors, which often lack the funds to compete with publicly traded companies, private equity firms have significant levels of capital at their disposal and are highly integrated into global financial markets. Private equity companies' reputation for leveraging acquired companies poses risks in the defense sector, in which companies' ostensible duty is to augment the public good of U.S. national security. The emergence of private equity firms as major players in the American defense sector represents an important shift in the industry and warrants further investigation by scholars and policy analysts alike.

Notes

1. Defense contractors received \$320 billion of the Department of Defense's \$587 billion budget for fiscal year 2017.
2. These figures use inflation adjusted fiscal year 2017 U.S. dollars.
3. In addition to for-profit corporations, U.S. defense and intelligence agencies also work with non-profit entities and universities; however, this work usually involves scientific research rather than activities supporting combat operations.
4. Recent examples of consolidation among the largest U.S. defense contractors include: 1) a proposed 2019 merger between Raytheon and the aerospace component of United Technologies that will result in the creation of a company with a \$165 billion market capitalization; 2) The 2019 merger between Harris Corporation and L3 Technologies that created L3Harris, a company valued at \$44.24 billion; 3) General Dynamics 2018 acquisition of CSRA for \$9.7 billion; 4) Northrop Grumman's 2017 acquisition of ATK Orbital for \$7.8 billion; 5) Leidos' acquisition of Lockheed Martin's information systems and global services businesses for \$4.6 billion in 2016.
5. There are two general contract types corporations enter into with U.S. government agencies: fixed price contracts and cost-plus contracts. Within these broad categories, there are numerous agreement structures including firm-fixed price (FFP), fixed price award fee (FPAF), cost-plus award fee (CPAF), and cost-plus fixed fee (CPFF). In the U.S. defense industry, contracts are generally structured as CPAF or CPFF.
6. All organizations – both within and outside government – must choose what goods and services they will produce internally and what operations they will outsource. Even organizations with high levels of vertical integration typically outsource important aspects of their operations. This 'make or buy' decision is foundational to the field of transaction cost economics (Coase 1960; Williamson 1981).
7. As mentioned previously, contractors also supply more mundane goods and services such as the provision of transportation, groundskeeping, the manufacture of bullets, and food provision. Even the most ardent critics of defense outsourcing do not suggest that the military perform these types of activities.
8. General Services Administration data includes only the top 100 contractors across each branch of the U.S. military.
9. These statistics are based on companies' form 10-Ks, annual reports, and public financial disclosures. All companies included in these statistics reported revenues of more than \$500 million in 2017.
10. Exchange traded funds are financial instruments that typically contain a basket of stocks tracking a particular industry or economic sector. They trade as single stock symbols on exchanges. Prices for the S&P Aerospace and Defense Exchange Traded Fund (XAR) and the S&P 500 Index (SPX) were recorded on 5 January 2013 and 5 January 2018.
11. Lower equity valuation for private companies vis-à-vis publicly traded companies is referred to in the literature as the private company discount (PCD). Koeplin, Sarin, and Shapiro (2000) find that in the U.S., privately owned companies sell at a multiple that is 20–30 percent lower than publicly traded corporations.
12. The study's key independent variable is corporate ownership structure – companies' shares may either be owned privately or publicly traded on stock exchanges. The inquiry's dependent variable is company size as measured by annual revenue and market capitalization.
13. For discussions about variation on the dependent variable in a within-case research design see George and Bennett (2005) and Gerring (2017).
14. Revenue is a company's gross income and consists of sales of goods and services to clients. Market capitalization is a measure of a company's size calculated by multiplying the total number of a firm's existing shares by the share price and represents the value of a company at a given point in time. Revenue is used as a measure of financial size rather than net income or profit because corporations seeking rapid growth often reinvest a significant portion of their earnings and may therefore have negligible profit margins.
15. On control and treatment cases in qualitative research see Gerring (2017, 114–115, 141–144).
16. STG was privately owned for most of its existence. The company was acquired by a special purpose acquisition corporation in late 2015 and retained the STG name after the acquisition.

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References

- Aeroweb. 2017. "U.S. Aerospace and Defense Companies: Financial Results and Performance." <http://www.fi-aeroweb.com/Aerospace-Defense-Companies.html>
- Avant, D. 2005. *The Market for Force: The Consequences of Privatizing Security*. Cambridge: Cambridge University Press.
- Avant, D., and R. de Nevers. 2011. "Military Contractors and the American Way of War." *Daedalus* 140 (3): 88–99. doi:10.1162/DAED_a_00100.
- Beach, D., and R. B. Pedersen. 2013. *Process-Tracing Methods: Foundations and Guidelines*. Ann Arbor, MI: University of Michigan Press.
- Bennett, A., and J. T. Checkel. 2015. *Process Tracing: From Metaphor to Analytic Tool*. Cambridge, UK: Cambridge University Press.
- Black, T. 2018. "General Dynamics Battles IT Firm in Midst of Trump of Trump Defense Spending Bonanza." *Bloomberg*, March 19. <https://www.bloomberg.com/news/articles/2018-03-19/general-dynamics-stands-pat-with-csra-bid-as-new-suitor-ups-ante>
- Block, S. 2007. "The Liquidity Discount in Valuing Privately Owned Companies." *Journal of Applied Finance* 17 (2): 33–40.
- Bloomberg Government. 2018. "BGGOV200: Federal Industry Leaders 2018." <https://about.bgov.com/downloads/bgov200/>
- Business Wire. 2007. "ManTech Completes the Acquisition of SRS Technologies, Inc." <https://www.businesswire.com/news/home/20070508005307/en/ManTech-Completes-Acquisition-SRS-Technologies>
- Business Wire. 2011. "ManTech Acquires TranTech Inc." <http://amda-njy9o.client.shareholder.com/releasedetail.cfm?releaseid=640981>
- Coase, R. 1960. "The Problem of Social Cost." *Journal of Law and Economics* 3: 1–44. doi:10.1086/466560.
- Cohen, R. 2010. "Putting a Human and Historical Face on Intelligence Contracting." *Orbis* 54 (2): 232–251. doi:10.1016/j.orbis.2010.01.005.
- De Santo, K. P. 2018. "Field of (private Equity) Dreams." *Kipps De Santo Investment Banking*. <https://kippsdesanto.com/field-of-private-equity-dreams/>
- Defense Industry Daily. 2005. *ManTech Acquires Gray Hawk in Bid to Break the \$1B Barrier*.
- Defense News. 2017. "Top 100 for 2017." <https://people.defensenews.com/top-100/>
- Deloitte. 2018. "2018 Global Aerospace and Defense Industry Financial Performance Study." <https://www2.deloitte.com/tr/en/pages/manufacturing/articles/2018-aerospace-and-defense-financial-performance.html>
- Deloitte. 2019. "2019 Global Aerospace and Defense Industry Outlook." <https://www2.deloitte.com/global/en/pages/manufacturing/articles/global-a-and-d-outlook.html>
- Duggan, M., and R. Carril. 2018. "The Impact of Industry Consolidation on Government Procurement: Evidence from DoD Contracting." Stanford Institute for Policy Research. <https://siepr.stanford.edu/sites/default/files/publications/18-027.pdf>
- Dunigan, M. 2014. "The Future of United States Military Contracting: Current Trends and Future Implications." *International Journal* 69 (4): 510–524. doi:10.1177/0020702014549677.
- Franck, R., and F. Melese. 2008. "Defense Acquisition: New Insights from Transaction Cost Economics." *Defense and Security Analysis* 24 (2): 107–128. doi:10.1080/14751790802124931.
- Fredland, J. E. 2004. "Outsourcing Military Force: A Transaction Cost Perspective on the Role of Military Companies." *Defense and Peace Economics* 15 (3): 206–209. doi:10.1080/10242690310001623410.
- General Services Administration. 2017. *Top 100 Contractors*. Washington, DC: United States Government. https://www.fpd.gov/fpdsgn_gms/index.php/en/reports/62-top-100-contractors-report
- George, A. L., and A. Bennett. 2005. *Case Studies and Theory Development in the Social Sciences*. Cambridge, MA: MIT Press.
- Gerin, R. 2005. "ManTech Acquires Gray Hawk." *Washington Technology*, May 5
- Gerring, J. 2017. *Case Study Research: Principles and Practices*. New York, NY: Cambridge University Press.
- Gholz, E. 2000. "The Curtis-Wright Corporation and Cold War-Era Defense Procurement: A Challenge to Military Industrial Complex Theory." *Journal of Cold War Studies* 2 (1): 35–75. doi:10.1162/15203970051032372.
- Goertz, G. 2017. *Multimethod Research, Causal Mechanisms, and Case Studies*. Princeton, NJ: Princeton University Press.
- Gregg, A. 2015. "STG Goes Public (sort Of)." *The Washington Post*, June 12.
- Gregg, A. 2018. "General Dynamics Embarks on \$9.6 Billion Deal to Capture New Defense Spending." *The Washington Post*, February 12.
- Gregg, A. 2019a. "Defense Mergers and Acquisitions Poised to Keep Pace in 2019." *The Washington Post*, January 12.
- Gregg, A. 2019b. "SAIC's No. 2 Gets Top Job as Moraco Prepares to Retire." *The Washington Post*, March 18.
- Hayes, H. 2006. "Profile: George Pedersen | Expectations Exceeded." *Washington Technology*, September 1.
- Hensel, N. 2010. "Can Industry Consolidation Lead to Greater Efficiencies? Evidence from the U.S. Defense Industry." *Business Economics* 45 (3): 187–203. doi:10.1057/be.2010.15.
- Hubler, D. 2011. "ManTech's Pedersen Assess the Market's Present and Future." *Washington Technology*, April 27. <https://washingtontechnology.com/articles/2011/05/02/pedersen-last-byte.aspx>

- Karpoff, J. M., D. S. Lee, and V. P. Vondracik. 1999. "Defense Procurement Fraud, Penalties, and Contractor Influence." *Journal of Political Economy* 107 (4): 809–842. doi:10.1086/250080.
- Koeplin, J., A. Sarin, and A. C. Shapiro. 2000. "The Private Company Discount." *Journal of Applied Corporate Finance* 12 (4): 94–101. doi:10.1111/jacf.2000.12.issue-4.
- Kooli, M., M. Kortas, and J. L'Her. 2003. "A New Examination Of The Private Company Discount: The Acquisition Approach." *The Journal Of Private Equity* 6 (3): 48–55. doi: 10.3905/jpe.2003.320051.
- Kovacic, W. E., and D. E. Smallwood. 1994. "Competition Policy, Rivalries, and Defense Industry Consolidation." *Journal of Economic Perspectives* 8 (4): 91–110. doi:10.1257/jep.8.4.91.
- Kratos Defense and Security Solutions. 2017. "Kratos Defense and Security Solutions, Inc. Prices Offering of Common Stock," September 7. <http://ir.kratosdefense.com/news-releases/news-release-details/kratos-defense-security-solutions-inc-prices-offering-common-0>
- Leander, A. 2005. "The Market for Force and Public Security: The Destabilizing Consequences of Private Military Companies." *Journal of Peace Research* 42 (5): 605–622. doi:10.1177/002234330505056237.
- Lehman, J. F., and S. L. Brooks. 2000. "Rapid Escalation: An Overview of Private Equity Investing in the Aerospace and Defense Industry." *The Journal of Private Equity* 3 (2): 7–11. doi:10.3905/jpe.2000.319955.
- Macias, A. 2018. "Trump Gives \$717 Billion Defense Bill a Green Light. Here's What the Pentagon Is Poised to Get." *CNBC*, August 13
- Mahoney, C. W. 2017. "Buyer Beware: How Market Structure Affects Contracting and Company Performance in the Private Military Industry." *Security Studies* 26 (1): 30–59. doi:10.1080/09636412.2017.1243912.
- ManTech International. 2010. "ManTech Announces \$200 Million Senior Notes Offering." April 1. <http://investor.mantech.com/static-files/b2657f79-04f0-440f-a4aa-051d4dc79b99>
- Markusen, A. 1997. "The Economics of Defense Industry Mergers and Divestitures." *Economic Affairs* 17 (4): 28–32. doi:10.1111/1468-0270.00055.
- Masunaga, S. 2019. "Scrutiny Over Pentagon Official's Boeing Ties Highlights Defense Industry Consolidation." *Los Angeles Times*, April 26.
- Maurer, T. 2017. *Cyber Mercenaries: The State, Hackers, and Power*. New York, NY: Cambridge University Press.
- McCarthy, E. 2002. "Contractors Join Forces as ManTech Buys Aegis." *The Washington Post*, July 2.
- McFate, S. 2014. *The Modern Mercenary: Private Armies and What They Mean for World Order*. New York, NY: Oxford University Press.
- Office of the Under Secretary for Defense Acquisition. 2008. *Creating an Effective National Security Industrial Base for the 21st Century*. Washington, DC: Defense Science Board Task Force.
- Pagano, M., F. Panetta, and L. Zingales. 1998. "Why Do Companies Go Public? An Empirical Analysis." *The Journal of Finance* 53 (1): 27–64. doi:10.1111/0022-1082.25448.
- Paglia, J. K., and M. Harjoto. 2010. "The Discount for Lack of Marketability in Privately Owned Companies: A Multiples Approach." *Journal of Business Valuation and Economic Loss Analysis* 5 (1): 1–26. doi:10.2202/1932-9156.1089.
- Peters, H. M., M. Schwartz, and L. Kapp. 2017. *Department of Defense Contractor and Troop Levels in Iraq and Afghanistan: 2007–2017*. Washington, DC: Congressional Research Service.
- Phillips, G. M., and G. Sertsios. 2017. "Financing and New Product Decisions of Private and Publicly Traded Firms." *The Review of Financial Studies* 30 (5): 1744–1789. doi:10.1093/rfs/hhw106.
- Priest, D., and W. M. Arkin. 2011. *Top Secret America: The Rise of the New American Security State*. New York: Little Brown and Company.
- Robinson, M. A. 2005. "Technology Company Closes in on Founder's Goal." *Signal*, October. <https://www.afcea.org/content/information-technology-company-closes-founders-goal>
- Sapolsky, H. M., E. Gholz, and C. Talmadge. 2017. *United States Defense Politics: The Origins of Security Policy*. New York, NY: Routledge.
- Saunders, A., and S. Steffen. 2011. "The Costs of Being Private: Evidence from the Loan Market." *The Review of Financial Studies* 24 (12): 4091–4122. doi:10.1093/rfs/hhr083.
- Schenone, C. 2010. "Lending Relationships and Information Rents: Do Banks Exploit Their Information Advantages?" *The Review of Financial Studies* 23 (3): 1149–1199. doi:10.1093/rfs/hhp080.
- Schmidt, M. S. 2016. "Air Force, Running Low on Drone Pilots, Turns to Contractors in Terror Fight." *The New York Times*, September 5.
- Schwartz, M. 2014. *Defense Acquisition Reform: Background, Analysis, and Issues for Congress*. Washington, DC: Congressional Research Service.
- Schwartz, M., J. F. Sargent Jr, and C. T. Mann. 2018. *Defense Acquisitions: How and Where DoD Spends in Contracting Dollars*. Washington, DC: Congressional Research Service.
- Sherman, E. 2018. "House and Senate Democrats Vote Overwhelmingly for \$716 Billion Military Budget." *Forbes*, June 20.
- Singer, P. W. 2003. *Corporate Warriors: The Rise of the Privatized Military Industry*. Ithaca, NY: Cornell University Press.
- Socha, E. 2000. "Small Business Top 10 Companies." *Washington Technology*, September 8. <https://washingtontechnology.com/Articles/2000/09/08/8a-amp-Small-Business-Top-10-Companies.aspx?Page=2>
- Standard and Poors. 2017. *Key Credit Factors for the Aerospace and Defense Industry*. New York, NY: McGraw Hill Financial.

- Stanger, A. 2009. *One Nation under Contract: The Outsourcing of American Power and the Future of American Foreign Policy*. New Haven, CT: Yale University Press.
- Sugawara, S. 1988. "Air of Mystery Envelops ManTech International." *The Washington Post*, October 31. doi:10.3168/jds.50022-0302(88)79586-7.
- U.S. Department of Defense. 2016. "Department of Defense (dod) Releases Fiscal Year 2017 President's Budget Proposal." February 9.
- van Doorn, P. 2018. "Aerospace and Defense Sector May Keep Flying High for Years to Come." *MarketWatch*, September 19.
- Wakeman, N. 2017a. "STG Makes \$119 Million Deal to Expand Intel Business." *Washington Technology*, February 21. <https://washingtontechnology.com/blogs/editors-notebook/2017/02/stg-deal-pss.aspx>
- Wakeman, N. 2017b. "Is STG's \$119.5 Million Deal for PSS Dead?" *Washington Technology*, May 4. <https://washingtontechnology.com/blogs/editors-notebook/2017/02/stg-deal-pss.aspx>
- Walt, P. 2002. "STG Buys Decision Systems Technologies," *Washington Technology*, October 2." <https://washingtontechnology.com/articles/2002/10/07/stg-buys-decision-systems-technologies.aspx>
- Washington Technology. 2002. "2002 Top 100." <https://washingtontechnology.com/Articles/2002/05/03/Top-100.aspx?Page=2>
- Washington Technology. 2015. "2015 Top 100." <https://washingtontechnology.com/toplists/top-100-lists/2015.aspx>
- Wicker, B. 2017. "ManTech to Acquire InfoZen for \$180M." *Washington Exec*, September 24. <https://www.washingtonnexec.com/2017/09/mantech-acquire-infozen-180m/>
- Wilkens, R. 2018a. "How the SOSi-STG Deal Came to Be." *Washington Technology*, April 12. <https://washingtontechnology.com/articles/2018/04/12/sosi-stg-deal.aspx>
- Wilkens, R. 2018b. "ManTech Scores \$1B NSA IT Win." *Washington Technology*, July 12. <https://washingtontechnology.com/articles/2018/07/12/mantech-nsa-it-win.aspx>
- Williamson, O. 1981. "The Economics of Organization: The Transaction Cost Approach." *The American Journal of Sociology* 87 (3): 548–577. doi:10.1086/227496.
- Witko, C. 2011. "Campaign Contributions, Access, and Government Contracting." *Journal of Public Administration Research and Theory* 21 (4): 761–778. doi:10.1093/jopart/mur005.
- Witte, G. 2006. "SAIC Offering Raises \$1 Billion." *The Washington Post*, October 14.