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procurement activities. That is, firms face significant asset specificity in B2G exchanges because of the federal government's idiosyncratic nature, so the projected cash flows from B2G exchanges are more volatile. In this regard, we contribute to marketing theory by disentangling the positive and negative ways in which government customer emphasis affects multiple areas of firm performance.

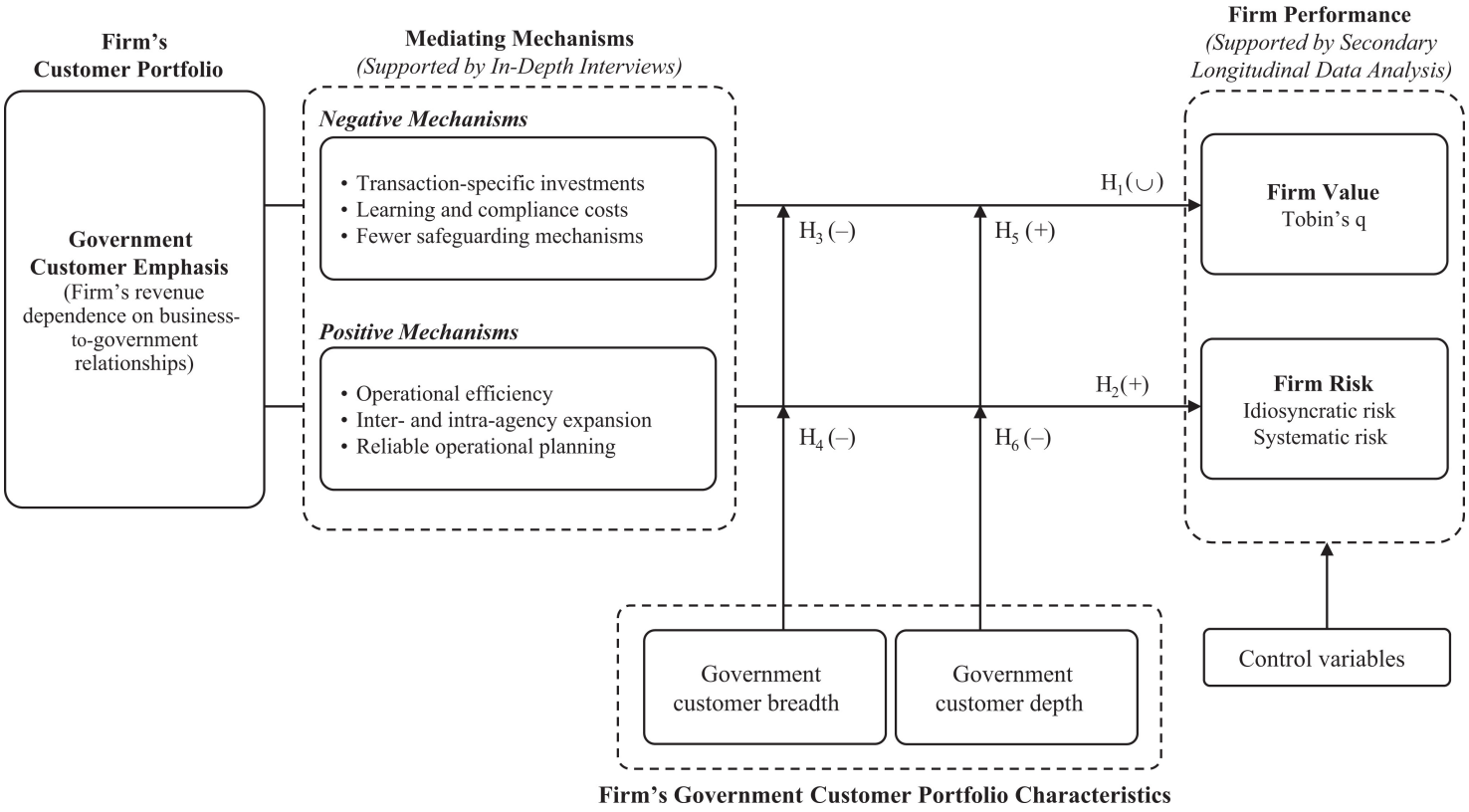


Figure 1. Performance implications of B2G relationships.

Notes: In-depth interviews were conducted with experts in government procurement.

Third, we elucidate boundary conditions of the effect of government customer emphasis, according to two critical customer management strategies: breadth and depth (Figure 2). Government customer breadth reflects the diversity and scope of the firm's government customer portfolio (Fang, Palmatier, and Grewal 2011). We find that high government customer breadth suppresses the positive, nonlinear effect of government customer emphasis on firm value. Greater government customer breadth requires the firm to make additional idiosyncratic investments to manage diverse government agencies. These investments increase the firm's costs and sap its performance gains. However, greater breadth also makes the firm less susceptible to unanticipated changes in government procurement because having a diversified government customer portfolio (Saboo, Kumar, and Anand 2017) mitigates the increase in risk brought on by the firm's government customer emphasis. Government customer depth refers to the intensity and closeness of the firm's government customer portfolio

(Fang, Palmatier, and Grewal 2011). It provides the firm with detailed insights about specific customers' procurement and purchasing behaviors, making the firm more efficient in managing idiosyncratic tendencies. These deep insights and improved efficiencies then protect the firm from unanticipated changes in government activities, attenuating the increased idiosyncratic and systematic risks that accompany the firm's government customer emphasis. Thus, we contribute to marketing theory concerning customer portfolio management by illustrating the contextual effect of both breadth and depth.

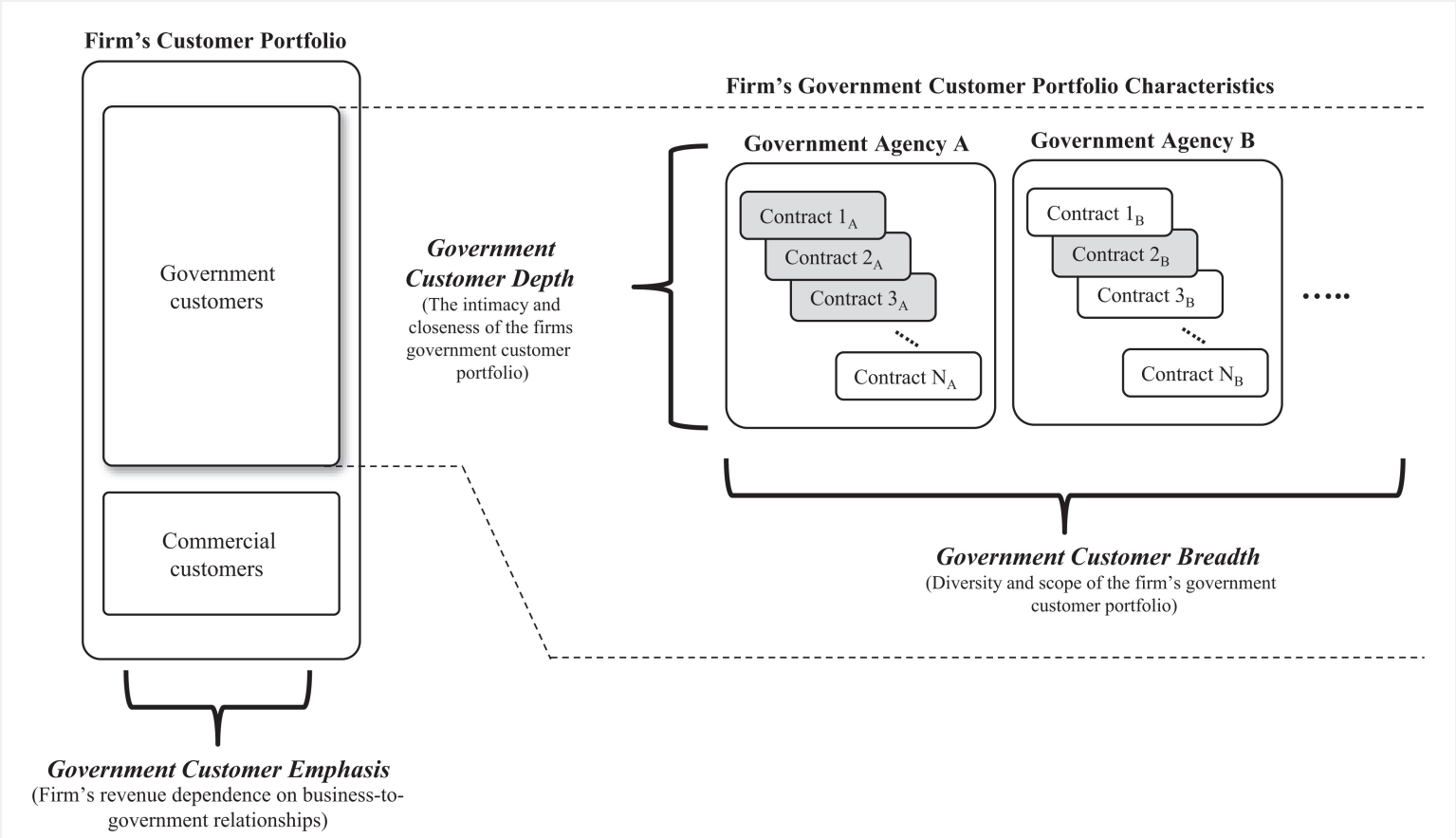


Figure 2. Conceptualization of government customer emphasis, government customer breadth, and government customer depth.

Notes: A colored contract represents the contract awarded to the focal firm. Key constructs are italicized.

Fourth, we offer prescriptive guidance for managers and policy makers. Our findings demonstrate the importance of becoming government "purists" (high government customer emphasis) instead of "tourists" (low government customer emphasis). Until selling to the government becomes a significant strategic focus, firms struggle to extract benefits from this customer relationship. Firms seeking to engage in this marketplace need to fully commit to the exchange to realize performance gains. We also provide guidance on how firms should manage their portfolio of government customers, namely, by forming deep, rather than transactional, relationships to minimize their exposure to unanticipated

changes in federal procurement. They also should seek to build relationships with a narrow set of key government customers (concentrated strategy) to achieve greater value, but with the recognition that this approach can add volatility to their performance. For policy makers, our results show that regulations create high entry barriers to B2G markets, which promotes incumbency (because incumbent firms already possess the necessary government compliance knowledge). Federal policy makers should carefully reassess procurement processes and regulations if they wish to ensure that government contracting operates more like a competitive marketplace.

B2G Relationships: Evidence from In-Depth Interviews

The U.S. government has attracted scholarly interest in economics (Lichtenberg 1988, 1992), finance (Ciccotello and Hornyak 2000), accounting (McGowan and Vendrzyk 2002), and management (Hadani and Schuler 2013). Marketing mostly addresses the government as a market regulator, investigating the influences of public policies on marketing efforts (e.g., Andrews, Burton, and Kees 2011). The omission of the government as a customer is surprising, especially considering the significance of the B2G marketplace (Grewal and Lilien 2012).

To address the lack of scholarly work on B2G exchanges, we conducted 19 in-depth interviews with practitioner experts (Web Appendix A) to gain theoretical insights (Kohli and Jaworski 1990). We purposely kept these interviews unstructured to improve the richness of the data. Each interview contained three broad questions: (1) describe doing business with the federal government, (2) describe how it differs from commercial relationships, and (3) describe what makes a firm successful in this space. The interviewer then asked follow-up questions based on the responses. Interviews were recorded, transcribed, and coded (both transcriptions and interviewer's notes) using standard qualitative techniques (Coffey and Atkinson 1996; Saldaña 2009) to identify major themes (Braun and Clarke 2006) and theories-in-use (Strauss and Corbin 1990). Web Appendix B contains an overview of our qualitative analytical strategy. Our interviews suggest three major qualities of the B2G marketplace that make it distinct from commercial, business-to-business (B2B) exchanges (Table 1). They also help enumerate the costs and benefits firms face in this marketplace. We expand on both of these issues next.

Table 1. Comparison of Business-to-Government and Business-to-Business Relationships.

Criteria	B2G	B2B
Description		
Nature of the business	The exchange of goods and services between businesses and government agencies	The exchange of goods and services between businesses

Criteria	B2G	B2B
Examples of customers	Department of Defense, Department of Veterans Affairs, Department of Justice, Department of Agriculture, Department of Education	Walmart, IBM, General Electric, Apple, ExxonMobil, Weyerhaeuser
Procurement Mission		
Value proposition	Driven by public stakeholder interests and welfare, required to provide societal welfare to satisfy specific stakeholder requirements set by Congress or the White House	Driven by value and solutions; procurement decisions are geared toward solving critical problems and optimizing performance of solutions
Procurement risk preference	Low risk tolerance; purchases based on prior specifications with little incentive for innovation	Medium to high risk tolerance; purchases based on the needs of the organization; a firm may seek innovative solutions to differentiate itself from competitors
Spending pressures	Close monitoring of government spending from U.S. voters and Congress	Varies depending on the nature of the organization
Procurement Regulations and Oversights		
Regulatory minutia	Subject to the Federal Acquisition Regulation and agency-specific regulations	Idiosyncratic to the organization; not subject to the Federal Acquisition Regulation
Procedural transparency	Most aspects of the bidding and procurement process are open to public discourse	Difficult to gain information about competitors' offerings and prices
Relationship-building tactics	Subject to Code of Federal Regulations; heavy regulations related to providing incentives to procurement officers	Not subject to Code of Federal Regulations; less stringent rules related to providing incentives to buyers
Procurement Scale, Scope, and Planning Horizon		
Size and variety of contracts	Multiple contract sizes (small dollar amounts to multibillion-dollar awards); multiple contract structures (fixed price, cost reimbursement, etc.)	Varies
Solvency and prompt payment	Timely payment schedule (15 days in many cases; Klein 2012); virtually no solvency issues	Less prompt payment schedules; varying degrees of solvency

Unique Characteristics of Government Customers

Procurement mission

Our interviewees noted several key differences surrounding the procurement mission in B2G relative to B2B relationships: value proposition, risk preference, and spending pressures. First, the value proposition for B2B exchanges is defined by best value (Frazier et al. 2009), manifested by hyperrational buying behavior (Johnston and Bonoma 1981). In contrast, B2G procurement is a mixture of value and socioeconomic goals. As stewards of taxpayers' resources and social initiatives, government procurement offices often must provide societal welfare, in addition to value, through their buying behavior. As noted by our interviewees:

> So, in the commercial space, they are after a solution to a very specific problem.…And the government, they might have a big problem, but they have all of these procurement rules that prohibit them from just going and saying, "who are the top three firms that could solve this problem?" They have to think about socioeconomic goals.…There's a big push to have small business, small disadvantaged businesses, service-disabled, veteran-owned businesses. (Ellen, executive vice president [VP])

> I think the big difference again is they just don't have a product that they're marketing, a physical product, it's more…whatever the mission of that particular agency or state department is. (Don, senior account executive)

These societal goals may not always align with optimal procurement practices. For example, the government's set-aside initiative reserves a significant portion of prime contracts (program goal of 25%) for historically disadvantaged firms, resulting in billions of dollars in contracts being off-limits to specific firms, regardless of their ability to deliver superior value. When asked about selecting suppliers on the basis of quotas versus value, our interviewees indicated:

> That's not common in commercial industry. Commercial industry would not tolerate the inefficiencies. (John, CEO)

Further complicating this issue is that socioeconomic goals and initiatives undergo dramatic changes in response to political cycles. Individual programs and offices are subject to the political designs of each administration (*Wall Street Journal* 2017b). Commercial customers exhibit similar changes in their strategic vision after leadership turnovers, but the degree of change is not as drastic, as two informants explain:

> The Obama administration…like six months before they left, if they believed in it, they should have done it earlier, an executive order, which has since been filed to be withdrawn by the Department of Labor, 'cause now you have the Trump administration. (John, CEO)

> They're forced to cut significant programs. And the timing of the budgets affects a tremendous amount in the [B2G] business world. (Ken, chief marketing officer [CMO])

Second, commercial and federal customers often vary in their procurement risk preference. Our interviewees noted that federal procurement buying agents have little incentive to take risks acquiring novel solutions or technologies:

> Government might use a product they used 20 years ago.…It got approved back then, so they [the procurement officer] just keep using the same specs. (Scott, CEO)
>
> But the bottom line is, nobody gets paid to think creatively as federal contractors, there's very little reward for it. (John, CEO)
>
> There's no real accountability [for postacquisition product/service performance] built in for the people who are procuring it [government buyer]. (Anne, executive director)

Third, the U.S. government faces spending pressures to reduce overall costs. It has instituted specific acquisition rules to reduce federal spending. For example, contracts often are awarded to the lowest bidder that meets the minimal requirements for that contract, based on the Federal Acquisition Regulation (FAR) that requires selection of the lowest price technically acceptable (LPTA) source. Accordingly, our respondents note:

> Government contracts…are very purposefully kept low-margin. (John, CEO)
>
> You just have to bid the lowest price. 'Cause that's what they will take. I've heard of people, I've heard of contracting officers not even opening the technical proposal, just opening the prices and then just starting with the lowest one. (Ellen, executive VP)

Compounding this issue, the LPTA rule has been condemned for increasing federal procurement risk aversion (H.A.S.C. 112-99 2012). Cost reduction is an important consideration in B2B settings, but price alone rarely is the sole selection criterion (Jap 2003). Rather, B2B suppliers may use price to signal higher quality (Haruvy and Jap 2013). A high price–high quality strategy is not feasible in the current LPTA procurement landscape.

Procurement regulations and oversights

The B2G procurement process features regulations and oversights that are either missing or not as prevalent in the commercial space (H.A.S.C. 112-99 2012). Firms must manage the government's regulatory minutiae related to every aspect of procurement, from who can bid to the price paid to the

acceptable delivery of the product or service. The FAR stipulates the exact nature of procurement transactions and establishes specific rules and guidelines that firms must follow:

> It's binders and binders of rules about what you should and shouldn't do when you're acquiring things. (Ellen, executive VP)
>
> But I have the DOD [Department of Defense] coming in and going, "Well, we want this, we need you to do this or we'd like to do this, if you did this." That's great, I look at the contract, the contract says, "You got these sorts of rules and regulations, you have to live and die by." (Bruce, senior account executive)
>
> Agencies…whether it's defense contracts or whether it's in defense or it's on the civilian side, follow acquisition regulations that are very, very detailed. (Anne, executive director)

Further differentiating the two sectors, regulations create procedural transparency in the procurement process, diminishing information asymmetry. For example, firms can easily follow competitive submissions and bids on a certain contract and then contest the loss of a contract to a competitor through an appeals process, potentially spilling propriety information to the market:

> Most awards, most sales, are protested by the losing competitor these days…[whereas] if I'm Oracle and I'm competing against SAP to be Under Armour's enterprise resource planning system and I lose, I don't file a protest with a government agency to have them relook the decision to go with SAP. (John, CEO)

Moreover, relationship-building tactics are heavily regulated. For example, under FAR, potential and current contract vendors may not provide any incentives to procurement officers (directly or indirectly, encompassing almost any gratuity, gift, favor, entertainment, loan, or item with monetary value) or attempt to glean information from those officers. These restrictions go directly against relationship marketing tactics often lauded for their effectiveness in driving improved seller outcomes (Palmatier, Dant, and Grewal 2007). Regulations also restrict firms from engaging in certain marketing activities to gain market insights and force them to disclose acquired information to the entire competitive industry before they can win a contract. Unlike B2B, the punitive consequences for any violations are powerful and enforceable:

> You're not allowed to give gifts over $25 and you're not allowed to take people out to fancy dinners, or invite them to conferences that are exclusive.[1] (Ellen, executive VP)
>
> In the commercial world, if you can take, if "Bob" takes the Nike supply chain manager out and takes him golfing, gets him drunk and everything like that, the Nike supply chain

> manager's not gonna let that affect his decision, but he might.…But here's the difference, you go to jail if you do that on the government side. (John, CEO)

Procurement scale, scope, and planning horizon

The last aspect of B2G pertains to the size, scale, and consistency of procurement activity (Apgar and Keane 2004). The government's purchasing footprint is enormous and cannot be duplicated in the commercial sector, whether in the dollar value or the number of contracts.[2]

> There are big budgets there; we wanted a piece of that business. (Paul, CMO)
>
> The government is the industry of industries. (Anne, Executive Director)
>
> The size of the contracts and the length of the contracts are just blown away.…The idea that you can win a $30 [million] or $50 million contract is like, "Wow." (Ellen, executive VP)

In addition, government customers are less likely to have solvency issues and declare bankruptcy (Dhaliwal et al. 2016), and they make prompt payments (15 days in many cases), compared with commercial clients (Klein 2012).

> From the investor's side, there's predictability of revenue, right?…The long-term predictability of the contracts, and I know my compatriots on the commercial side are just.…They're just blown away. (Ellen, executive VP)
>
> [It's] a slow bureaucrat and everything, but it's reliable and predictable.…There's no volatility here.…There are reliable 20–25-year trends you can build your business around on the government side. I don't know a single [commercial] business that looks like that. (John, CEO)

These characteristics yield costs and benefits that are distinct from other B2B sectors.

Cost and Benefit Trade-Offs of a Firm's Government Emphasis

Costs of government emphasis

Firms face stringent rules in the contract bidding process, which creates substantive learning and compliance costs. Firms must become familiar with idiosyncratic procurement approval processes and bidding requirements to acquire government contracts; as Deborah (regional manager) notes, there are "always a lot of restrictions and qualifications." Failure to follow these regulations can result in a firm being suspended or even disbarred from acquiring future contracts.

> [The] government has the ability throw you out of the business, pretty at much at will.…[The] suspension piece of it is just about zero due process. It's hello, we have an allocation against you, and you are hereby suspended, which means you can't get any new contracts or new orders, you can finish out what you already have, but you can't get anything new, until we terminate the suspension.…Time is of the essence. You live and die on your task or delivery orders, which come in every day, that's where your revenue can just completely stop. (James, senior partner)

Moreover, suppliers often struggle with the additional financial regulations associated with government contracting. For example, lending institutions may restrict financing options:

> You cannot, on a standard line of credit from a bank, [banks] will not loan on government sales.…Standard loan docs negate being able to borrow against government sales. (Kevin, chief financial officer)

A House subcommittee noted that a federal accounting audit cost a small firm $4 million in business over a six-month period (H.A.S.C. 112-99 2012). Firms in the B2G marketplace also must maintain their ethical, law-abiding behavior or face steep penalties. Walmart had to pay a $300 million fine and almost lost its right to enter into government contracts because of a foreign corruption investigation (*Wall Street Journal* 2017c). Some regulations even restrict commercial market access:

> And I look at the fine print, and the fine print says, "You have to get licensing agreements from the DOD agency or from Department of State." I'm going, "Oh, wait a minute." They may not let you sell them to China, which is a really big part of my market and I'm not gonna give that up…if the government, particularly with the DOD, if the government pays for certain technologies and you don't have the right terms and conditions in your contracts, your hands can be tied when it comes to selling commercially. (Bruce, senior account executive)

The learning requirements to understand federal procurement regulations result in firms making significant transaction-specific investments (TSIs) in B2G (Rindfleisch and Heide 1997). "It costs a lot of money just to become a preferred supplier and start bidding contracts," said Tim (CEO). Firms often must develop separate product lines and corporate systems just to meet the government's strict standards regarding marketing tactics, audits, human resource management, operational activities, and social responsibility. For example, the Labor Department's Office of Federal Contract Compliance Programs requires firms to retain all employee recruitment data and conduct outreach efforts (Casuga 2016). Government customers may also require completely different manufacturing processes or raw material sourcing decisions from what the firm typically deploys. Specifically, the Buy American Act of

1933 requires products to be manufactured or materially altered in the United States or approved locations, as specified under the FAR (§ 52.225-11). Modifications to the FAR are also common and frequent, as noted by Christine (senior partner): "The *Federal Register* issues new FAR clauses like once a week." Thus, B2G TSIs are essential to ensure compliance with regulation and oversight, but they are difficult to redeploy to other functional areas because of their high asset specificity. This scenario represents an inherent opportunity cost for firms operating in B2G exchanges.

Firms also lack a means to safeguard their TSIs from government procurement variability (e.g., unanticipated provisions unfavorable to the firm, unexpected executive orders). Regulations provide the government with significant asymmetric power in the exchange: it can change the terms of a contract at any time for "government convenience." Given the significant TSIs, firms have little recourse but to comply.

In summary, because of the government's extensive contract enforcement mechanisms to screen vendors (ex ante evaluation) and monitor their performance and behavior (ex post evaluation) (Lichtenberg 1988), firms incur significant costs to operate in B2G exchanges. The result is high asset specificity (Heide and John 1988), because the TSIs and the knowledge gained are immobile, limiting the firm's ability to safeguard these assets. Although costs related to ex ante and ex post evaluation are also present in B2B markets, the TSIs required to operate in B2G markets lead to higher costs and have substantially higher asset specificity than in commercial contexts, resulting in unique performance implications for the firm.

Benefits of government emphasis

The government provides scale, scope, and long-term sales potential. First, the nature of government procurement enables firms to enjoy economies of scale and improve their operational efficiency through high-volume and high-dollar contracts (Apgar and Keane 2004).

> They help provide our manufacturing plant a critical mass and necessary volume in order to meet our production schedules. (Darryl, CMO)
>
> The benefit can be huge for those that are able to make the proper connections to get to the right people and through the red tape and paperwork processes, because the volumes purchased for some of the government projects out there can be large. And, for those willing to stick it out and to try to cover them, it can lead to real decent profit. (Troy, president)

Second, government procurement spans a wide range of industries, creating abundant inter- and intra-agency expansion opportunities. For example, the Department of Defense (DOD) comprises the Navy, Army, Air Force, Marine Corps, and Coast Guard, and each branch procures a wide array of products and services—from combat ships and trucks to logistics management and building construction

services, and nearly every product in between (Woods 2017). Because these multiple branches and procurement offices operate under the same DOD FAR procurement umbrella, firms can reuse their functionalities and knowledge to gain cross- and up-selling opportunities to generate additional revenues. Also, some interagency procurement characteristics overlap, which may help a firm expand into new agencies.

Third, the long-term planning horizon and prompt payment schedules allow firms to enjoy reliable operational planning. They can rely on longer lead times in their sales cycles, and "unlike corporate customers…, federal government customers are much less likely to default or declare bankruptcy" (Dhaliwal et al. 2016, p. 25). At times, the government is even willing to bear some of the cost burden of its own procurement. For example, contractual arrangements may offer cost reimbursements (i.e., the government pays some of the vendors' allowable costs incurred and even cost overruns), granting vendors more flexibility in their resource deployment.

> So, a large percentage of government contracts are cost-reimbursable contracts. Nobody in their right mind would do that in the commercial world. (John, CEO)

Similar to the costs of B2G exchanges, some of the benefits may generalize to other contexts in isolation, but when taken together, these considerations produce unique performance implications for B2G exchanges. Combining the cost and benefits identified earlier, we see that B2G exchanges expose firms to high costs related to learning and compliance, TSIs, and the need to safeguard the firm's assets, but these exchanges also offer numerous expansion opportunities (e.g., cross- and up-selling, growth potential) and operational efficiency benefits related to the government's procurement scale, scope, and reliable operational planning, which ultimately affect firm performance.

Effect of Government Customer Emphasis on Firm Performance

We draw on transaction cost economics (Rindfleisch and Heide 1997), agency theory (Lichtenberg 1988), and resource-based views (Palmatier, Dant, and Grewal 2007) to illustrate the effect of a firm's government customer emphasis on its performance. The government (principal) offers contracts to firms (agents), over which it has significant regulatory control (i.e., regulation and oversight for ex ante screening of potential contractors and ex post monitoring of their compliance). In response, firms make TSIs to manage their government relationships, resulting in inflated costs. These investments/assets are highly idiosyncratic to the B2G exchange and difficult to redeploy elsewhere, but they enable firms to accumulate domain-specific knowledge about relevant rules, regulations, and procurement needs, which may create a valuable, rare, inimitable, and nonsubstitutable resource that can enhance performance (Eisenhardt and Santos 2002). Accordingly, we evaluate the effects of government customer emphasis on firm value and firm risk (see Figure 1).

Effects of Government Customer Emphasis on Firm Value

Noting the positive and negative mechanisms associated with a firm's government customer emphasis, we expect a positive, nonlinear relationship with firm value. At low levels of government emphasis, the inflated costs of B2G exchanges outweigh the benefits. To initiate and expand B2G activities, a firm must invest significant assets into the exchange. The asset specificity of these TSIs gives rise to opportunity costs because the firm cannot invest in otherwise productive assets. In addition, the firm faces steep learning costs related to the regulatory minutiae associated with government procurement and often lacks expansion opportunities across and within agencies. Thus, an ad hoc approach of acquiring contracts manifests as a firm's inability to acquire sufficient domain knowledge about federal procurement to overcome the regulatory burden and low margins of government contracting. The firm then faces the brunt of B2G costs, without capturing enough benefits.

As the firm's government emphasis increases, though, it builds substantial experience in procurement processes and regulations, allowing it to overcome the cost challenges. With the additional knowledge gained from its TSIs (Palmatier, Gopalakrishna, and Houston 2006), the firm can manage government regulatory minutiae and agency guidelines to reduce its learning and compliance cost burden. Moreover, the firm can use this intimate knowledge to expand its government presence, as well as leverage greater operational and scale efficiencies.

> You just gotta tool yourself in that way, and there're just different levels of expertise and processes and manufacturing, and it's just a different thing. And it can be extremely lucrative when you start to aggregate a lot of low-margin, but big-dollar and long-term kinds of relationships. (Jeff, partner)

Thus, at lower levels of government customer emphasis, the transaction-specific costs associated with government relationships outweigh the operational efficiency improvements. However, as a firm's government customer emphasis increases, it begins to gain economies of learning about how to navigate regulatory issues, thus minimizing costs while gaining critical insights into customer needs that enable the firm to expand its scale and operational efficiencies. Thus, the benefits of a firm's government customer emphasis accrue at an increasing rate. Formally stated,

H_1: A firm's government customer emphasis has a positive, nonlinear effect on firm value, such that firm value improves at an increasing rate as its government customer emphasis increases.

Effects of Government Customer Emphasis on Firm Risk

We focus on two components of firm risk: idiosyncratic (volatility related to firm-specific actions) and systematic (volatility related to the stock market). According to the efficient market hypothesis, risk is

the market's assessment of stock price volatility, based on a linear projection of past stock returns and information (Fama and MacBeth 1973). Thus, we expect a linear effect of government emphasis on firm risk (Srinivasan and Hanssens 2009). Although consistency in procurement activities would appear to reduce risks, the high asset specificity that firms face in this exchange has a stronger impact such that government customer emphasis poses more risk to the firm. The significant TSIs required for this marketplace, combined with their immobility, expose the firm to additional uncertainty from unanticipated changes to the B2G exchange. This scenario results in the underutilization of B2G-specific assets, which are difficult to redeploy to other functional areas because of their high asset specificity, thus increasing projected cash flow volatility.

In terms of idiosyncratic risk, the firm becomes more susceptible to unanticipated changes in the procurement process (e.g., expanded compliance requirements, delivery pressures, additional costs) as its government customer emphasis increases. For example, Lockheed Martin had to cut costs (and thus revenue) of the F-35 fighter jet in response to sudden political pressure, which prompted a 4% drop in its market value (*Wall Street Journal* 2017a). This susceptibility to government variability means that a greater government customer emphasis produces more firm-specific uncertainty in projected future cash flows due to the firm's limited ability to safeguard its government TSIs.

> You look at General Dynamics [a major U.S. defense contractor]…that's a problem. Because if the government decides they're gonna stop doing business…that has a negative impact on the revenue stream for those particular companies [major federal contractors], because that is their life, doing business with the federal government. (Bruce, senior account executive)
>
> Here's another little difference in the sales thing over the long term, that [government] customer may switch pretty fluidly back and forth between competitors every couple of years. So, you can't imagine Under Armour, vast empire, global empire of everything, switching back and forth between SAP and Oracle every five years, but that happens all the time with government agencies and various services they contract for. (John, CEO)

Morever, in complying with procurement regulations, firms experience high exposure risk from federal audits and investigations, which shine bright lights on firms. An audit by the Defense Contract Audit Agency led to claims that Northrop Grumman overbilled the Navy on shipbuilding contracts; the firm agreed to settle "to focus on the ongoing business operations" (*Government Executive* 2003). Negative publicity and punitive financial repercussions have been shown to lead to higher projected cashflow volatility (Luo 2007). In addition, as a firm's government emphasis increases, more of its operations become public knowledge because of procedural transparency, which can result in the public dissemination of a firm's core competencies, especially if contract protests arise. Thus, a firm's limited

ability to offset unanticipated government purchase behavior, combined with high exposure risk due to government regulations, increases its idiosyncratic risk.

We also posit that an increasing government customer emphasis is less likely to reduce the firm's susceptibility to market volatility. During market downturns, the government faces extreme pressure to cut costs and revamp the economy, so it often makes changes to federal budgetary priorities and procurement reforms (e.g., the DOD's Better Buying Power initiative in 2009). A firm's government customer emphasis increases its vulnerability to this potential market volatility because its assets are difficult to redeploy to commercial markets.

> Boeing, Lockheed, and Northrop have historically struggled to diversify their portfolio during (government) slowdowns, Lockheed tried making parking meters and toll roads, Boeing tried making (school) buses, and Northrup tried making canoes. None of these succeeded. (John, CEO)

The introduction of stimulus packages during economic downturns also creates hypercompetition in the contract bidding process, as firms herd around available financial resources (Honek, Azar, and Menassa 2012). The combination of competitive and cost-reduction pressures raises levels of market pressure and uncertainty.

Finally, policy changes and election cycles leave firms that have a high government customer emphasis more susceptible to market fluctuations because of the ability of these changes to affect the macroeconomy. Although it lacks bankruptcy risks, the U.S. government still faces budget pressures and sequestration during economic recessions (CNN Money 2013), which can interrupt firms' cash flow. Sequestering and continued discussion of the country's fiscal health likely remain quite salient to financial markets. Thus, a high government emphasis may increase the firm's susceptibility to market volatility because the firm's ability to shield its B2G-related TSIs from budgetary and political fluctuations is limited. Formally stated,

H_2: A firm's government customer emphasis increases its (a) idiosyncratic and (b) systematic risk.

Moderating Effect of the Firm's Government Customer Portfolio Characteristics

The U.S. government is a singular marketplace with numerous customers (e.g., Department of State, DOD). The unique nature of each agency produces significant heterogeneity in the firm's government customer portfolio (Grewal, Chandrashekaran, and Citrin 2010; Tarasi et al. 2011), so the firm's ability to translate the net benefits of government customer emphasis into superior performance varies by the way it manages these customers. Therefore, we focus on two key customer portfolio characteristics, government customer breadth and depth, which have considerable implications for the

extent to which the incremental benefits surpass the underlying costs of operating in B2G marketplaces.

Government customer breadth

Government customer breadth refers to the diversity and scope of the firm's government customer portfolio (Fang, Palmatier, and Grewal 2011). Firms with low breadth (concentrated portfolio) receive a sizable portion of their revenue from a smaller subset of their government customer base, whereas firms with high breadth (diversified portfolio) have their revenues more evenly distributed across many government customers. Interfirm literature demonstrates clear differences between these two approaches. Low breadth often improves the firm's operational efficiency and lowers transaction costs because of the firm's limited focus on satisfying a small set of customer needs (Saboo, Kumar, and Anand 2017), but it also increases the firm's dependence on a few major customers and creates opportunism concerns (Campello and Gao 2017). High breadth reduces a firm's dependence, increasing its bargaining power (Saboo, Kumar, and Anand 2017). It also offers more expansion opportunities (Rindfleisch and Moorman 2001), but it can spread a firm's resources thin (Lee et al. 2015).

In light of the uniqueness of B2G exchanges, we posit that greater government customer breadth weakens the positive, nonlinear effect of government customer emphasis on firm value. Firms with high breadth must respond and adapt to a myriad of idiosyncratic regulations and requirements from a wide array of agencies. As noted by our informants:

> Agencies vary widely on how they measure and track contractors. (Anne, executive director)
>
> Agencies may have their own little supplement to FAR. (Christine, senior partner)
>
> [In regard to breadth:] It's going to be a bigger barrier.…It's very different doing business in different agencies…very different rules agency to agency. (Andy, principal)

Firms' TSIs and learning costs thus multiply from a high breadth approach. For example, the needs and procurement regulations of the Department of Homeland Security (to prevent terrorism and secure cyberspace) and the Department of Agriculture (to provide citizens access to safe, nutritious, and balanced meals) differ substantially, and a firm serving multiple agencies must allocate specific resources to manage each. High breadth may provide potential expansion opportunities with other agencies, but such opportunities would be difficult for the firm to realize until it has deployed considerable TSIs to learn each government customer's unique needs and regulations. As a result, at a higher level of government customer breadth, the cost burden associated with the firm's government customer emphasis increases. Moreover, the idiosyncratic nature of each agency presents challenges to the firm's ability to acquire singificant knowledge about a particular agency's procurement policies

and purchasing needs when pursuing a high breadth strategy. The lack of sufficient customer knowledge stores would reduce operational efficiency with greater government customer emphasis. We posit that it is more advantageous for firms to focus on a concentrated set of government customers to increase firm value. This focus allows the firm to accumulate more customer-domain knowledge, which will improve operational efficiency and need fulfillment (Lee et al. 2015) and lower the cost to serve that customer.

> There's an old business axiom, "stick with what you know," and I think what applies in this industry is that you stick with whom you know. (James, senior partner)

Formally stated,

H_3: Government customer breadth weakens the positive, nonlinear effect of government customer emphasis on firm value.

However, greater customer breadth offers a benefit. We expect government customer breadth to mitigate the effect of government customer emphasis on firm risk, because greater breadth implies a diversified customer portfolio. At a higher level of breadth, the firm becomes less dependent on a particular agency and thus less susceptible to the fluctuations of any one revenue source, whether due to unanticipated changes in procurement policies (idiosyncratic risk) or government priorities (systematic risk); see Fang, Palmatier, and Grewal (2011). In contrast, a firm with a concentrated strategy is highly dependent on a small set of customers for its revenue, which may allow it to extract more value in the immediate but fails to provide safeguards against potential unanticipated changes. This perspective on risk is consistent with marketing research (Saboo, Kumar, and Anand 2017) and our interviews:

> I had this client who had a big government contract for three years and they were doing great, then, all of a sudden, the government dropped them as a supplier, and now they're really hurting financially. (Emily, portfolio and risk manager)

> If one contract officer wakes up on the wrong side of the bed, you're in trouble. (Andy, principal)

> A single account, a single agency, it is dangerous because it is a single customer base, I think it is dangerous to be concentrated with one agency.…It is not that simple to transfer that skills, knowledge, relationships, customer domain knowledge and think that another agency will be the same. (James, senior partner)

Also, consider that the Department of Energy's budget is slated to be cut by 3%, while the Department of Commerce's budget will increase by 6% (*Government Executive* 2018). Contracting with both agencies could smooth some of the resulting cash flow volatilities. This approach is in line with a recent analysis noting that "the agencies' functions vary as widely as their budgets, and they have faced many different peaks and troughs over the past 40 years" (*Washington Post* 2017). Thus, we expect government customer breadth to help shield the firm from market disruption and generate more reliable, consistent cash flows from an increasing government customer emphasis. Formally stated,

H_4: Government customer breadth weakens the positive effect of government customer emphasis on (a) idiosyncratic and (b) systematic risk.

Government customer depth

Government customer depth refers to the intensity and closeness of the firm's government customer portfolio (Fang, Palmatier, and Grewal 2011), reflected in the share of business that the government customer allocates to the firm (i.e., agency share of wallet). Greater relationship depth fosters stronger mutual commitment (Kumar, Scheer, and Steenkamp 1995) and enhances knowledge transfers (Swaminathan and Moorman 2009), which allows firms to gain better insights into customers' needs and improve their loyalty (Mende, Bolton, and Bitner 2013). However, depth can lead to relational inertia, create more dependency concerns due to relationship-specific investments, and lead to knowledge redundancies (Rindfleisch and Moorman 2001; Scheer, Miao, and Palmatier 2015).

As a firm with deep government relationships increases its government customer emphasis, we expect an increase in firm value because the net benefits accumulate faster. Deep relationships provide firms with detailed knowledge about the idiosyncratic purchasing requirements and missions of a specific customer, so they should be more efficient in predicting future demands, understanding the customer's rules and regulations, and seizing expansion opportunities. For example, if a firm builds a deep relationship with the DOD (high share of wallet) by supplying multiple procurement offices and branches (e.g., Navy, Army, Air Force), it can apply the knowledge it gains from one branch to another and may be more sensitive to changing needs. The critical insights obtained from deep relationships make the learning and operational processes more efficient and put the firm in an advantageous position to adapt to and meet changing customer needs (Lee et al. 2015).

> Where are you on that agency's food chain? That's an important question we always ask. (Andy, principal)

> [In discussing what the stock market looks for when evaluating a firm's government business] What they [the financial market] want is deep customer relationships, deep customer knowledge. And that gets you the best value in the marketplace. (Bill, senior financial analyst)

> Over time, you would be able to get and extract more value out of that, more margin over a long period of time.…You had the opportunity, then, to prove yourself, deliver on what you'd committed to deliver. (Anne, executive director)

Formally stated,

H_5: Government customer depth strengthens the positive, nonlinear effect of government customer emphasis on firm value.

Government customer depth should mitigate the effect of government customer emphasis on firm risk. Specifically, critical knowledge developed from deep government customer relationships should inform the firm about how to resolve contract issues and when to expect potential delays, audits, or even contract revisions, ensuring more consistent cash flows as its government customer emphasis increases (Fang, Palmatier, and Grewal 2011). Deep customer insights can help the firm anticipate changes in the customer's procurement activity and minimize variability threats, which in turn mitigates increased idiosyncratic risk from a high government customer emphasis. Moreover, we expect deep customer relationships to provide added protection to firms in volatile markets. Firms in B2G exchanges often must demonstrate their commitment to the specific missions and interests of individual agencies:

> You have to define who you are with a client, what your value is, and why you're there to serve them and have them, then the officials in that agency, really believe in your sincerity and commitment to them by demonstrating that you understand the mission of their organization, that you're investing in them for the long haul. (Anne, executive director)

> It's knowing the customer's needs, their particular needs, according to their mission, it's knowing the culture, don't listen to anybody who tells you this business is not about relationships, it is, you can't take them to Morton's [Steakhouse]…[but] it is still relationship driven.…[The agency will say] I want "Joe Schmo" [contractor] as the program manager.… What I [the agency] care about is that "Joe" is on the job, because I like "Joe," I love him. (James, partner)

That is, we expect that agencies are more likely to maintain a committed partner rather than other "arms-length" contractors if faced with spending pressures. Thus, deep relationships mitigate market concerns resulting from a high government customer emphasis. Formally stated,

H_6: Government customer depth weakens the positive effect of government customer emphasis on (a) idiosyncratic and (b) systematic risk.

Research Methodology

Data Sources

We assembled our data from the Center for Research in Security Prices (CRSP), COMPUSTAT, and the U.S. Government Accountability Office. We downloaded the names of all publicly traded firms (2000–2017) from COMPUSTAT/CRSP, and then we downloaded the entire contracts database from the U.S. Government Accountability Office (2018). We then used the firms' DUNS (data universal numbering system) numbers to merge data sources. This process identified 1,854 firms that received at least one federal prime contract payment. After accounting for missing observations and excluding firms with only one year of federal revenue, we obtained a final sample of 1,360 firms from various industries (see Web Appendix C).

Measures

Financial measures

We used Chung and Pruitt's (1994) measure of Tobin's q as our proxy for firm value, in which Tobin's q = (MVE + PS + DEBT)/TA, where MVE refers to the closing prices of shares at the end of the financial year times the number of common shares outstanding; PS is the liquidation value of outstanding preferred stock; DEBT indicates current liabilities, minus current assets, plus the book value of inventories plus long-term debt; and TA is the book value of total assets. Consistent with prior research (e.g., Dotzel, Shankar, and Berry 2013), we measured idiosyncratic risk as the standard deviation of residuals of the Carhart four-factor model and systematic risk as the beta for the market rate of return minus the risk-free rate of return from the Carhart four-factor model. The four-factor model data came from Kenneth French's website (French 2018), and daily stock return data came from CRSP.

Government measures

We calculated a firm's government customer emphasis as the total dollar amount of government contracts awarded to the firm, divided by its total sales revenue in each year. This ratio thus reflects a firm's revenue dependence on B2G exchanges.

We calculated firm government customer breadth using a Herfindahl concentration index (Fang, Palmatier, and Grewal 2011). We first identified the set of major agencies that awarded contracts to the firm each year. Firm i's government customer breadth, measured across the firm's J major agencies, is $1 - \sum_{j=1}^{J} (\text{AwardAmount}_{ijt}/\text{AwardAmount}_{it})^2$, where AwardAmount_{ijt} represents the dollar amount of government contracts awarded to firm i by agency j (j = 1, 2,…, J) in year t, and AwardAmount_{it} is the total dollar amount of government contracts awarded to firm i by all major agencies in year t. We subtracted this score from 1 to assess breadth.

We measured government customer depth as the average agency share of wallets across the firm's major agencies (Fang, Palmatier, and Grewal 2011). That is, firm i's government customer depth, measured across the firm's J major agencies, is $(1/J)\sum_{j=1}^{J}(\text{AwardAmount}_{ijt}/\text{AwardAmount}_{jt})$, where AwardAmount_{ijt} represents the dollar amount of government contracts awarded to firm i by agency j in year t, and AwardAmount_{jt} is the total dollar amount of government contracts awarded to all firms from agency j in year t. This measure is multiplied by 1,000 so that the means of breadth and depth are roughly similar.

Control variables

We controlled for the nature of B2G contracts (multiyear contract intensity, fixed-pricing intensity, and assortment size) and firm characteristics (firm size, firm leverage, return on assets, liquidity, research and development [R&D] intensity, no-R&D dummy, dividend, firm growth, tangibles intensity). Contracts can be awarded for products/services that will be delivered over multiple years, so we assess multiyear contract intensity as the dollar amount of the multiple-year awards divided by the total dollar amount of contracts received in each year. Fixed-pricing intensity is the dollar amount of fixed-pricing contracts, divided by the total dollar amount of contracts received in each year. Firms also vary in their offering portfolio, so we control for assortment size with a count of the number of unique product/service codes, normalized by the number of agencies with which firms have contracts, then log-transformed to alleviate skewness and kurtosis (Chatterjee and Hadi 2006).

The firm-level controls reflect extant marketing research (e.g., McAlister, Srinivasan, and Kim 2007). For firm size, we take the natural log of the number of employees. Firm leverage is a ratio of the firm's long-term debt to its total assets. Return on assets refers to the ratio of net income over total assets. Liquidity reflects the ratio of current assets to liability. For R&D intensity, we use the ratio of the firm's R&D expenditures to its total sales revenue. Following prior literature (e.g., Hirschey, Richardson, and Scholz 2001), we impute missing values of R&D expenditures to 0 and include a no-R&D dummy that is equal to 1 if the R&D expenditure value is missing. Dividend is the ratio of cash dividends to the total market value of the stock. Firm growth refers to the percentage growth in total assets. For tangibles intensity, we calculate the ratio of a firm's property, plant, and equipment expenditures to its total assets. To ensure that extreme values do not affect our results, we winsorize all the continuous variables at their 99% level (Jindal and McAlister 2015). Finally, we include year and industry dummies based on the two-digit North American Industry Classification System (NAICS) code.[3] Table 2 contains the construct definitions and operationalizations, and Table 3 presents the descriptive and correlation statistics.

Table 2. Construct Definition and Operationalization.

Construct	Definition	Operationalization
Firm value	Firm's long-term financial performance	Tobin's q based on Chung and Pruitt's (1994) method (Dotzel, Shankar, and Berry 2013; Fang, Palmatier, and Steenkamp 2008)
Idiosyncratic risk	Firm's performance variability that is not related to the entire stock market movement and thus unique to the firm	Standard deviation of residuals of the Carhart four-factor model (Dotzel, Shankar, and Berry 2013; McAlister, Srinivasan, and Kim 2007)
Systematic risk	Firm's performance variability that is related to the entire stock market movement	Calculated as beta from the Carhart four-factor model (Dotzel, Shankar, and Berry 2013; McAlister, Srinivasan, and Kim 2007)
Government customer emphasis	Firm's revenue dependence on business-to-government relationships	The total dollar amount of government contracts awarded to the firm, divided by its total sales revenue in each year
Government customer breadth	Diversity and scope of the firm's government customer portfolio	Herfindahl's concentration index, or the sum of squared shares of total revenue of government contracts awarded by agency j (j = 1, 2,…, number of major contracting agencies with which the firm interacts) to the total revenue of government contracts awarded to firm i. We subtracted the concentration ratio from 1 to measure breadth (Fang, Palmatier, and Grewal 2011; Saboo, Kumar, and Anand 2017)
Government customer depth	Intensity and closeness of the firm's government customer portfolio	Average agency share of wallets, or the average ratio of the firm's total revenue of government contracts awarded by the agency to the total revenue of government contracts awarded to all firms by the agency, across each (major) agency of the firm (Fang, Palmatier, and Grewal 2011; Kumar and Venkatesan 2005). This measure is multiplied by 1000, so that the means of breadth and depth are roughly similar
Multi-year contract intensity	The extent to which a firm is awarded multi-year contract	The dollar amount of the multiple-year awards divided by the total dollar amount of contracts received in each year
Fixed pricing intensity	The extent to which a firm is awarded fixed pricing contracts	The dollar amount of fixed pricing contracts, divided by the total dollar amount of contracts received in each year

Construct	Definition	Operationalization
Assortment size	Variety of offerings that the firm supplies to agencies	The number of unique product/service code, normalized it by the number of agencies that firms have contracts with. This measure is log-transformed to alleviate skewness and kurtosis
Firm size	Size of the firm	Natural log of the number of employees (McAlister, Srinivasan, and Kim 2007)
Financial leverage	The extent to which the firm lacks financial flexibility to make strategic investments	The ratio of the firm's long-term debt to its total assets (Luo 2007)
Return on assets	Firm's profitability	The ratio of the firm's net income over its total assets (Josephson, Johnson, and Mariadoss 2016)
Liquidity	The ability of the firm to convert assets into cash	The ratio of current asset to liability (McAlister, Srinivasan, and Kim 2007)
R&D intensity	The extent to which the firm invests in R&D activities	The ratio of the firm's R&D expenditure to its total sales revenue (Hirschey, Richardson, and Scholz 2001)
No R&D dummy	Indicator of missing values of R&D expenditure	Dummy variable coded as 1 if R&D expenditure value is missing, and 0 otherwise (Hirschey, Richardson, and Scholz 2001)
Dividend	Dividend payout of the firm	The ratio of cash dividends to the total market value of the stock (McAlister, Srinivasan, and Kim 2007)
Firm growth	Growth rate of the firm	The percentage growth in total assets (Fang, Palmatier, and Steenkamp 2008)
Tangibles intensity	The extent to which the firm owns physical and tangible assets	The ratio of a firm's property, plant, and equipment expenditures to its total assets (Tuli, Bharadwaj, and Kohli 2010)

Table 3. Descriptive Statistics and Correlations.

Variables	Correlatio

Variables	1	2	3	4	5	6	7	8	Correlation
	1	2	3	4	5	6	7	8	9
1. Firm value	1								
2. Idiosyncratic risk	−.02	1							
3. Systematic risk	.00	.09	1						
4. Government customer emphasis	−.02	.04	.01	1					
5. Government customer breadth	.02	−.12	−.01	.00	1				
6. Government customer depth	−.03	−.09	−.01	.46	.10	1			
7. Multi-year contract intensity	−.04	−.06	.00	.05	−.03	.04	1		
8. Fixed pricing intensity	.05	−.03	−.01	−.24	.02	−.18	−.10	1	
9. Assortment size	.00	−.17	.01	.31	.17	.23	−.03	−.03	1
10. Firm size	−.07	−.34	.01	.04	.10	.29	.01	−.05	.25
11. Financial leverage	−.17	−.03	.03	−.06	.04	−.02	.07	.00	−.05
12. Return on assets	.16	−.28	−.03	−.15	.08	.04	−.02	.03	.10
13. Liquidity	.22	.10	.01	.02	−.12	−.10	−.06	.05	.00

Variables	Correlatio									
	1	2	3	4	5	6	7	8	9	
14. R&D intensity	.10	.13	.02	.17	−.06	−.02	.01	−.06	−.06	-
15. No R&D dummy	−.21	−.07	−.03	−.03	.04	.00	.11	−.05	−.20	.
16. Dividend	−.12	−.18	−.03	−.02	.05	.05	.10	−.06	−.03	.
17. Firm growth	.15	−.17	−.02	−.04	.02	.00	.00	.01	.04	.
18. Tangibles intensity	−.20	−.11	−.03	−.13	−.06	−.10	.10	−.03	−.25	.
Mean	1.58	.09	.99	.02	.28	.67	.04	.82	.94	1
SD	1.25	.06	1.73	.08	.27	2.47	.15	.31	.81	1

Notes: $p < .05$ for $r > .03$ and $r < -.03$.

Model Specification

We use a system generalized method of moments (GMM) estimator (Arellano and Bond 1991; Arellano and Bover 1995; Blundell and Bond 1998) to account for key challenges associated with serial correlation, endogeneity, autocorrelation, and heteroskedasticity that could be present in our panel data set. We specify our model as follows:

$$\begin{aligned}\text{FirmValue}_{it} = \; & \beta_0 + \beta_1 \text{FirmValue}_{it-1} \\ & + \beta_2 \text{Govt Customer Emphasis}_{it} \\ & + \beta_3 \text{Govt Customer Emphasis}_{it}^2 \\ & + \beta_4 \text{Govt Customer Emphasis}_{it} \times \text{Govt Customer Breath}_{it} \\ & + \beta_5 \text{Govt Customer Emphasis}_{it}^2 \times \text{Govt Customer Breath}_{it} \\ & + \beta_6 \text{Govt Customer Emphasis}_{it} \times \text{Govt Customer Depth}_{it} \\ & + \beta_7 \text{Govt Customer Emphasis}_{it}^2 \times \text{Govt Customer Depth}_{it} \\ & + \beta_8 \text{Govt Customer Breath}_{it} + \beta_9 \text{Govt Customer Depth}_{it} \\ & + \beta_{10} \text{ControlVariables}_{it} + \beta_{11} \text{Year Dummies} + \beta_{12} \text{Industry Dummies} + \delta_i + \in_{1it},\end{aligned} \tag{1}$$

$$\begin{aligned}\text{FirmRisk}_{it} = {} & \gamma_0 + \gamma_1 \text{FirmRisk}_{it-1} \\ & + \gamma_2 \text{Govt Customer Emphasis}_{it} \\ & + \gamma_3 \text{Govt Customer Emphasis}_{it} \times \text{Govt Customer Breath}_{it} + \gamma_4 \text{Govt Customer Emphasi} \\ & + \gamma_5 \text{Govt Customer Breath}_{it} + \gamma_6 \text{Govt Customer Depth}_{it} \\ & + \gamma_7 \text{Control Variables}_{it} + \gamma_8 \text{Year Dummies} + \gamma_9 \text{Industry Dummies} + \eta_i + \epsilon_{2it},\end{aligned} \tag{2}$$

Although GMM uses first-differencing to remove unobserved firm fixed effects (δ_i in Equation 1 and η_i in Equation 2), the resulting regressors are not strictly exogenous. We therefore instrument each endogenous variable with its own lags (Roodman 2006). We treat the key independent variable (government customer emphasis), the interactions involving them, and the lagged dependent variable as endogenous, and then we adopt instrumental variables. This process may make our models sensitive to overfitting biases because of the many instruments,[4] so we follow Roodman's (2009) procedure and limit the lag lengths (two- through four-period lags). We then collapse the instrument matrix instead of using all possible lags (Bansal et al. 2017; Fang et al. 2016). The Tobin's q model (Equation 1) has more endogenous variables than the risk models (Equation 2) because of the quadratic term (government customer emphasis squared) and its interactions, so we limit the lagged values to two- and three-period lags for the firm value model to lower the risk of instrument proliferation further.

These second and further lagged values of government emphasis and performance measures are relevant and valid instruments for two reasons. First, they should be strong predictors of the current values of government customer emphasis, given the variables' persistence (e.g., Feng, Morgan, and Rego 2015; Tuli, Bharadwaj, and Kohli 2010). Second, it seems unreasonable to assume that the values of government emphasis that firms selected two or more years ago would affect the unanticipated shocks to performance in the current year, after accounting for past performance. That is, the second and further lagged values of government emphasis affect the performance only through their first-stage effect on the current value of government emphasis. To check that our instruments are justified, we ran two relevant tests. The nonsignificant AR(2) test shows the absence of second-order serial correlation in residuals, and the nonsignificant Hansen J-test overidentification statistics indicate that our instruments are valid. Next, we use Windmeijer's (2005) two-step robust estimator to correct for panel-specific autocorrelation and heteroskedasticity. We also residual-center our interaction terms to account for multicollinearity concerns (Hennig-Thurau, Houston, and Heitjans 2009; Lance 1988).

Correcting for Self-Selection Bias

Firms that acquire government contracts could have different unobserved competences and resources than those that do not, which might bias our statistical inference. We thus address the firm's endogenous choice to acquire government contracts using Heckman's (1979) two-step self-selection correction approach. In the first stage, we extend our sample to all publicly traded firms in the same industry as the sample firms and apply a probit model to predict whether a firm will have a

government contract for that year. We regress the choice variable (1 if a firm has government contracts and 0 otherwise) on factors that might influence the likelihood of firms' acquiring government contracts. Along with the control variables in the main analysis (i.e., firm size, firm leverage, return on assets, liquidity, R&D intensity, no-R&D dummy, dividend, firm growth, tangibles intensity) and the year and industry dummies, we include a valid instrumental variable that can serve as an exclusion restriction. This variable should affect the likelihood that a firm has a government contract, but it does not influence the performance outcomes in the second-stage model. In line with prior literature (Bansal et al. 2017; Germann, Ebbes, and Grewal 2015), our instrument represents the prevalence of government contracts among the focal firm's peers. These firms operate in the same two-digit NAICS category as the focal firm and are similar in size (same asset quartile; Kale, Reis, and Venkateswaran 2009). The prevalence of government contracts reflects the number of firms with government contracts in the same peer group (other than the focal firm), divided by the total number of firms in that peer group, other than the focal firm.

Because the presence of peers with government contracts is unaffected by firm-level idiosyncratic shocks and does not correlate strongly with the residuals in Equations 1 and 2, the use of the peer firm's decisions satisfies the exclusion restriction condition. In addition, we expect a high correlation between firm strategic decisions and the proportion of peer firms that have observable government contracts; firms are often guided by similar industry norms and economic information. The first-stage Heckman estimation results show that contract prevalence among peers and the control variables strongly relate to the likelihood of acquiring government contracts (Web Appendix D). From this first-stage model, we obtain the estimated inverse Mills ratios (i.e., lambda), which we include in our main estimation (Equations 1 and 2).

Estimation Results

Table 4 contains the empirical results. We report models with main effects (Models 1, 3, 5) and models with main and moderating effects (Models 2, 4, 6). For H_1, we find a linear ($\beta = -5.31$, $p < .10$; Model 2) and positive quadratic term ($\beta = 11.64$, $p < .01$; Model 2), suggesting the positive, nonlinear effect of government customer emphasis on firm value that we predicted. In support of H_{2a} and H_{2b}, we find a positive, significant, linear effect on idiosyncratic ($\gamma = .10$, $p < .05$; Model 4) and systematic risk ($\gamma = 2.93$, $p < .05$; Model 6).

Table 4. Estimation Results of the Effect of Government Customer Emphasis on Firm Value, Idiosyncratic Risk, and Systematic Risk.

	Firm Value			Idiosyncratic Ris	
Variables	**Hypothesis**	**Model 1**	**Model 2**	**Hypothesis**	**Model 3**

Variables	Firm Value			Idiosyncratic Ris	
	Hypothesis	Model 1	Model 2	Hypothesis	Model 3
Main Effect					
Government customer emphasis		−11.89* (6.88)	−5.31* (3.04)	H_{2a}	.10** (.04)
Government customer emphasis^2	H_1	12.97** (6.53)	11.64*** (3.55)		
Moderating Effect					
Government customer emphasis × Government customer breadth			29.08*** (8.42)	H_{4a}	
Government customer emphasis^2 × Government customer breadth	H_3		−52.83*** (15.68)		
Government customer emphasis × Government customer depth			−.27 (.24)	H_{6a}	
Government customer emphasis^2 × Government customer depth	H_5		.37 (.31)		
Control Variables					
Government customer breadth		.36* (.21)	.19 (.18)		−.01 (.01)
Government customer depth		.08 (.07)	−.01 (.03)		−.00 (.00)
Multi-year contract intensity		.34** (.17)	.14 (.10)		−.01 (.01)
Fixed pricing intensity		−.20 (.23)	.09 (.12)		.00 (.00)

	Firm Value			Idiosyncratic Ris	
Variables	**Hypothesis**	**Model 1**	**Model 2**	**Hypothesis**	**Model 3**
Assortment size		.19 (.14)	.03 (.06)		−.01*** (.00)
Firm size		−.52* (.30)	−.16 (.17)		.00 (.01)
Financial leverage		−1.09* (.56)	−.40 (.34)		.05** (.02)
Return on assets		−.21 (1.45)	1.09 (.92)		−.06 (.04)
Liquidity		.06*** (.02)	.05*** (.02)		−.00*** (.00)
R&D intensity		.52*** (.17)	.28** (.13)		−.02** (.01)
No R&D dummy		−.07 (.08)	−.10 (.06)		.01 (.01)
Dividend		3.90 (3.43)	−.15 (2.07)		−.40*** (.15)
Firm growth		.11 (.13)	.02 (.10)		−.02*** (.01)
Tangibles intensity		1.86 (1.39)	.32 (.83)		−.05 (.06)
Lag of dependent variable		.41*** (.05)	.41*** (.05)		.09*** (.03)
Lambda		−2.11 (1.29)	−.62 (.76)		.06 (.05)
AR(1) (z-score)		−4.94***	−5.58***		−11.90***
AR(2) (z-score)		1.02	1.43		−.54
Hansen J overidentification test statistic		1.33	7.78		4.06
Number of instruments		67	79		66
Wald chi-square		21538.75***	23221.95***		19181.48***

Variables	Firm Value			Idiosyncratic Ris	
	Hypothesis	Model 1	Model 2	Hypothesis	Model 3
Number of firm-year observations		12246	12246		12151

Notes: Standard errors are in parentheses. Year dummies and industry dummies were included in all regressions.

* $p < .10$; ** $p < .05$; *** $p < .01$.

In terms of government customer breadth, the interaction of breadth and government customer emphasis squared is negative and significant (β = –52.83, $p < .01$; Model 2), in support of H_3. The nonlinear effect is weakened by high breadth, meaning that when breadth is high, the net benefit of government customer emphasis on firm value is reduced. In the risk models, we find a negative effect of the interaction between breadth and government customer emphasis on idiosyncratic risk (γ = –.20, $p < .10$; Model 4) but not on systematic risk (γ = –3.66, $p > .10$; Model 6), in support of H_{4a} but not H_{4b}. Regarding government customer depth, the interaction of depth and government customer emphasis squared on Tobin's q is positive but not significant (β = .37, $p > .10$; Model 2), so we cannot confirm H_5. The risk models show negative interaction effects of government customer emphasis and depth on both idiosyncratic (γ = –.01, $p < .05$; Model 4) and systematic (γ = –.24, $p < .05$; Model 6) risk, in support of H_{6a} and H_{6b}. Overall, seven of our nine hypotheses receive empirical support.

Robustness Analyses

Alternative model specifications

We perform multiple sensitivity analyses to examine the robustness of our results to alternative model and instrument specifications (Rossi 2014).[5] These analyses cover the types illustrated by Germann, Ebbes, and Grewal (2015, Table 2, pp. 5–6): unobserved heterogeneity model, rich data model, instrumental variable model, and panel internal instruments model (our main GMM model). First, for an unobserved heterogeneity model, we used ordinary least squares (OLS) with a lagged dependent variable to account for time-varying unobserved effects. Models 1–3 of Table 5 show that our findings remain consistent with those in Table 4. Second, for a rich data model, we used random effect regression (Models 4–6). The results are consistent with the main model. Third, for an instrumental variable model, we used an external instrument, according to a control function approach (Petrin and Train 2010). That is, we first estimate an auxiliary regression of the endogenous independent variable (government customer emphasis) on the instrument (Web Appendix E) and then include the estimated residuals from the first equation in the main equation. We use, as an instrument, the average

government customer emphasis of other firms in the same state but not in the same industry, excluding the focal firm's own government customer emphasis. We refer to this instrument as the state average government customer emphasis (e.g., John, Li, and Pang 2017). This instrument likely correlates with a firm's government customer emphasis because the government contracts won by other firms in the same state is likely to be affected by some common local shocks. Yet this instrument does not include peers in the same industry, so those firms' government customer emphasis should not have any direct impact on the focal firm's performance, satisfying the exclusion restriction. The results of our control function approach (Models 7–9) are similar to our main findings.

Table 5. Robustness Analysis: Alternative Model Specifications.

	OLS			Random Effect		
	Firm Value	**Idiosyncratic Risk**	**Systematic Risk**	**Firm Value**	**Idiosyncratic Risk**	**Syste Ri**
Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Mo**
Main Effect						
Government customer emphasis	−1.01*** (.31)	.03*** (.01)	.47* (.27)	−.62 (.52)	.04*** (.01)	.78**
Government customer emphasis^2	1.75*** (.52)			1.54** (.76)		
Moderating Effect						
Government customer emphasis × Government customer breadth	1.10 (1.09)	−.04* (.02)	−.48 (.88)	3.08* (1.69)	−.06* (.03)	−.28
Government customer emphasis^2 × Government customer breadth	−3.64* (1.99)			−4.58* (2.62)		

	OLS			Random Effect		
	Firm Value	Idiosyncratic Risk	Systematic Risk	Firm Value	Idiosyncratic Risk	Syste Ri
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Mo
Government customer emphasis × Government customer depth	−.02 (.05)	−.00* (.00)	−.08** (.03)	.02 (.09)	−.00 (.00)	−.10* (.04)
Government customer emphasis^2 × Government customer depth	.01 (.08)			−.10 (.13)		
Control Variables						
Government customer breadth	.02 (.03)	−.00* (.00)	−.08 (.07)	.07 (.05)	−.00 (.00)	−.03
Government customer depth	.00 (.00)	.00 (.00)	−.01 (.01)	−.01** (.01)	−.00 (.00)	−.01
Multi-year contract intensity	.03 (.05)	−.00 (.00)	.07 (.12)	−.03 (.07)	.00 (.00)	.07 (.1
Fixed pricing intensity	.05** (.02)	−.00 (.00)	−.08 (.06)	−.02 (.03)	.00 (.00)	−.08
Assortment size	.03** (.01)	−.01*** (.00)	−.03 (.03)	.03 (.02)	−.01*** (.00)	−.04
Firm size	−.04*** (.01)	−.01*** (.00)	.04** (.02)	−.15*** (.02)	−.01*** (.00)	.05**
Financial leverage	−.10** (.04)	.02*** (.00)	.53*** (.11)	−.53*** (.07)	.04*** (.00)	.52**
Return on assets	.99*** (.07)	−.05*** (.00)	−.32** (.15)	1.24*** (.09)	−.04*** (.00)	−.24

	OLS			Random Effect		
	Firm Value	Idiosyncratic Risk	Systematic Risk	Firm Value	Idiosyncratic Risk	Syste Ri
Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Mo
Liquidity	.02*** (.00)	−.00*** (.00)	.01 (.01)	.03*** (.01)	−.00*** (.00)	.02 (.(
R&D intensity	.14*** (.02)	−.01*** (.00)	−.01 (.06)	.19*** (.04)	−.00 (.00)	.02 (.(
No R&D dummy	−.13*** (.02)	−.00 (.00)	−.06 (.05)	−.17*** (.04)	−.00* (.00)	−.06
Dividend	−.83** (.34)	−.14*** (.02)	−1.50* (.82)	−2.06*** (.46)	−.07*** (.03)	−.17
Firm growth	−.29*** (.03)	−.02*** (.00)	−.10 (.08)	.27*** (.03)	−.01*** (.00)	−.06
Tangibles intensity	−.22*** (.05)	−.01* (.00)	−.22* (.12)	−.07 (.11)	−.01* (.01)	−.20
Lag of dependent variable	.61*** (.01)	.37*** (.01)	.02*** (.00)	—	—	—
Lambda	−.04 (.03)	.01*** (.00)	−.01 (.07)	.07* (.04)	.01*** (.00)	−.02
Government customer emphasis residuals	—	—	—	—	—	—
Intercept	.89*** (.10)	.08*** (.00)	.92*** (.17)	1.65*** (.19)	.06*** (.01)	1.41* (.25)
R-square	.63	.43	.02	.16	.32	.01
Number of firm-year observations	12246	12151	12151	12376	12376	12376

Notes: Standard errors are in parentheses. Year dummies and industry dummies were included in all regressions.

* $p < .10$; ** $p < .05$; *** $p < .01$.

Alternative sample characteristics

We also assess whether the main results are sensitive to alternative sample characteristics. First, we ran the model after excluding the year that the economic recession started (2008). In Models 1–3 of Web Appendix F, even after we excluded this recession year, the estimates are similar to those in Tables 4 and 5, which increases confidence in our findings. Second, we ran the model without firms that operate in regulated industries, which may adopt distinct business norms and procedures. A firm operates in a regulated industry if its primary NAICS code begins with 52 (finance and insurance) or 48 (transportation and warehousing). As Models 4–6 reveal, the core conclusions do not change.

Discussion

The marketing literature has extensively examined buyer–seller relationships in commercial markets, but it has yet to account for the role of the largest customer in the world: the U.S. government. The significance of the B2G market necessitates thorough investigation of its impact on business outcomes. Accordingly, we assess the financial implications of firms' B2G relationships, using a multimethod approach that establishes important insights for theory and practice.

Theoretical Implications

The findings from our exploratory, in-depth interviews contribute to marketing theory by indicating the uniqueness of B2G relationships and the resultant costs and benefits. Because of the government's significant regulatory oversight, firms make considerable investments in idiosyncratic assets, which result in safeguarding concerns. Yet the immense size of government procurement, in terms of its capabilities and economic footprint, makes it an extremely influential force. If they can overcome the inherent costs, firms stand to gain substantial economic rewards, such as operating efficiencies, expansion opportunities within and across agencies, and reliable planning. Thus, our findings contribute to marketing theory by highlighting the need to extend beyond traditional commercial relationships and consider the role of federal customers.

We also contribute to interfirm marketing theory by specifying the net performance impact of a firm's government customer emphasis. Our empirical analysis demonstrates effects on both firm value and risk. A firm's government customer emphasis improves its value at an increasing rate: as government customer emphasis increases, the benefits (e.g., efficiency, inter- and intra-agency selling) outweigh the costs (e.g., compliance and learning costs) such that the net benefits from B2G relationships accelerate faster. This finding is in line with prior assertions that "those who commit sufficient energy and resources can unlock vast opportunities with the U.S. military" (Apgar and Keane 2004, p. 45). However, increased dependence on the government undermines a firm's ability to safeguard assets tied to these exchanges, thus intensifying concerns about both idiosyncratic and systematic risk. The

market tends to reward firms that commit to this relationship, but the strategy comes at a price: they face higher risk.

We also contribute to the literature on customer portfolio management (Johnson and Selnes 2004) by revealing key customer relationship factors. The effects of a firm's government emphasis on firm value and risk differ according to its government customer breadth and depth. Firms pursuing a broad set of government customers fail to realize significant performance improvements as they increase their government customer emphasis. Breadth increases the firm's costs of doing business because it necessitates additional idiosyncratic investments to accommodate multiple procurement centers with unique characteristics. However, high breadth makes the firm less susceptible to unanticipated changes in government procurement, because its diversified government portfolio reduces risk. Next, we find that greater depth provides firms with critical insights into the idiosyncratic nature of government customers. These insights can protect the firm from unanticipated changes in government activities, thereby reducing the effect of government customer emphasis on idiosyncratic and systematic risk. Overall, we demonstrate the criticality of the firm's B2G relationship portfolio and thereby extend the contextual boundaries of marketing theory related to customer relationship management.

Managerial and Policy Implications

Implications for managers

Our findings provide several important implications for managers, suggesting both optimism and hesitation when it comes to B2G relationships. First, when firms decide to operate in B2G markets, they should seek to become "purists" (high government emphasis) rather than "tourists" (low government emphasis). As an illustration, consider Colgate-Palmolive and Curtiss-Wright, both of which invested 57% more in their B2G relationships but experienced contrasting effects on their firm value. Colgate-Palmolive's firm value fell by 4%, but Curtiss-Wright's grew by 32%. Colgate-Palmolive (tourist) failed to attain market benefits similar to those attained by Curtiss-Wright (purist). "[The government doesn't] want fair-weather friends; they want you in good times and bad times," said Ann (executive director). Being on the fence about building relationships with government customers is a potentially detrimental strategy. We provide more firm-specific examples in Web Appendix G.

Second, to gain further managerial insights into our effects, we plot the significant moderation effects of government customer breadth and depth and perform elasticity analyses. Figure 3 contains the fitted values of the relationship between government emphasis and the dependent variables at two representative levels of the moderator (±1 SD). We use estimates from our OLS model for our figures and elasticity values because they provide more managerially relevant insights (Rossi 2014). Panel A demonstrates that for low government customer breadth (concentration), the positive, nonlinear effect of government emphasis on firm value grows stronger. When breadth is low, a firm's government

emphasis begins to increase firm value at .29; after this point, the net benefits to firm value are accelerated. At the mean level of breadth, the curve is flattened such that the net benefits are less pronounced (turning point at .33). When breadth is high, the net benefits to a firm from increasing its government emphasis are significantly muted. However, high breadth enables firms to alleviate the increase in their idiosyncratic risk. Specifically, our elasticity analysis reveals that a 1% change in government emphasis increases idiosyncratic risk by only .15% when breadth is high versus .39% at the mean level of breadth. Thus, when deciding on a government customer breadth approach, managers must recognize certain inherent trade-offs: a concentrated portfolio increases firm value, whereas a diversified portfolio reduces idiosyncratic risk.

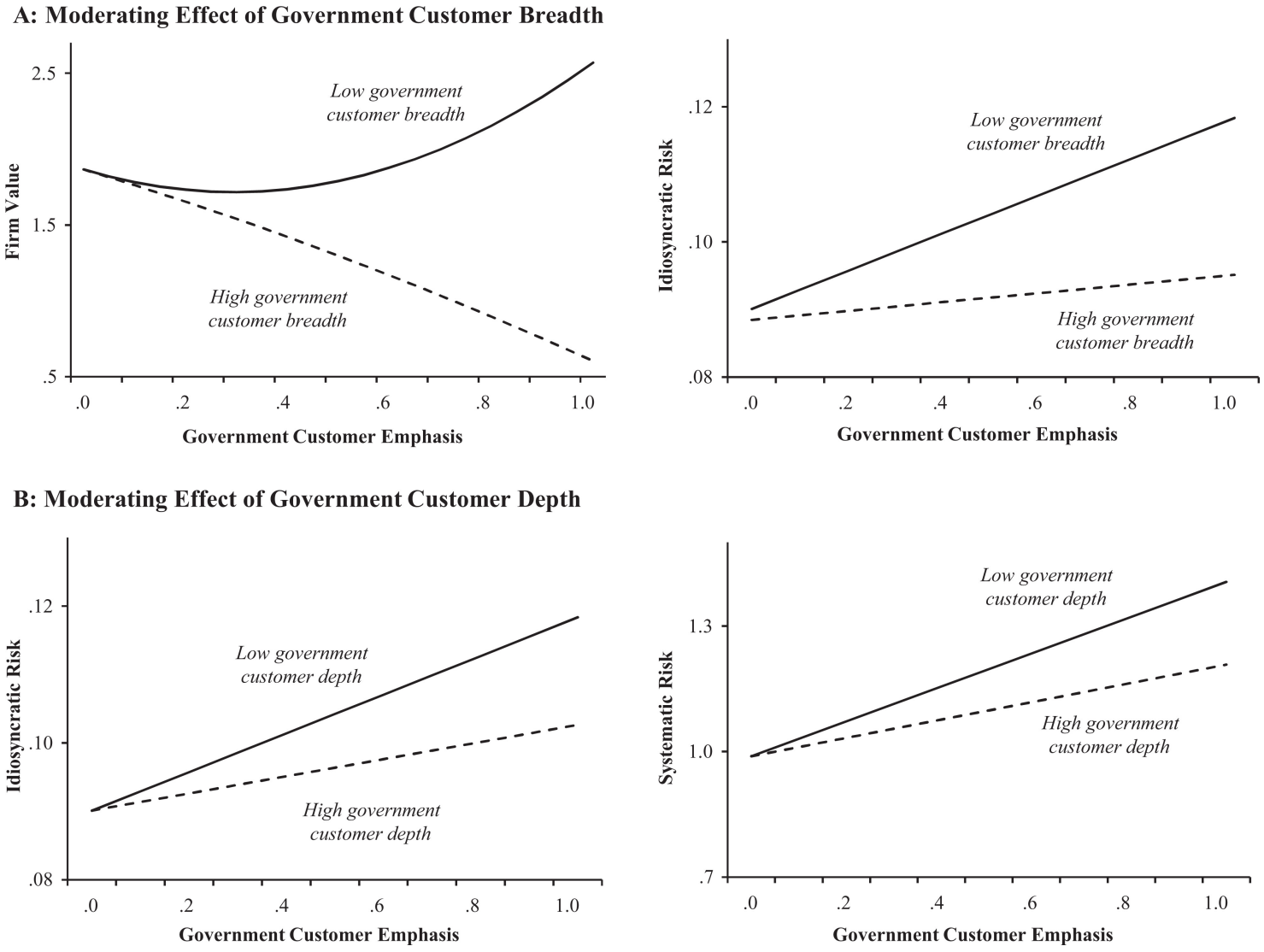


Figure 3. Moderating effects of government customer breadth and depth.

Next, for firms with high government customer depth, the increase in idiosyncratic and systematic risk brought on by government customer emphasis is mitigated (Panel B). When depth is high, a 1% change in government emphasis yields a .28% increase in idiosyncratic risk (versus .39% at the mean level of

depth) and a .44% increase in systematic risk (versus .84% at the mean level of depth). Thus, firms should build deeper relationships to alleviate risk from B2G relationships. This finding suggests a potential buffer for firms that wish to pursue a concentrated customer portfolio strategy, as firms appear to attain the most desirable strategic position when they develop deeper relationships (high depth) with a limited number of government customers (low breadth), thereby enhancing their value while lowering risk.

Third, to further support our findings about firm risk, we gathered annual reports (10-K filings) from purist firms; Web Appendix H illustrates their perspectives on the risks of B2G relationships. In line with our arguments, purist firms' end-of-year financial statements recognize key risk factors of selling to the government. In particular, government customers often make unanticipated changes to the procurement process ("Federal government contracts contain numerous provisions that are unfavorable to us [and]…are subject to laws and regulations that give the government rights and remedies, some of which are not typically found in commercial contracts"; CACI International) and create potential sources of negative publicity through federal audits ("Government contracts are subject to heightened reputational and contractual risks compared to contracts with commercial clients"; Accenture), which increase firms' idiosyncratic risk. Systematic risk also increases with changes in federal budgetary priorities and procurement reforms ("pressures on and uncertainty surrounding the federal budget, potential changes in priorities and defense spending levels, sequestration, the appropriations process, use of continuing resolutions…and the permissible federal debt limit, could adversely affect the funding for individual programs and delay purchasing or payment decisions by our customers"; Northrop Grumman), in combination with policy changes and election cycles ("Due to its complexity and continued uncertainty, the Affordable Care Act (ACA)'s impact remains difficult to predict and could adversely affect us"; UnitedHealth Group). This exploratory analysis of annual reports provides additional support for the relationship between government customer emphasis and firm risk, which should help managers understand the pertinent risk mechanisms. Our findings thus provide managerial insights into how B2G strategies can enable the firm to achieve greater levels of value, according to their risk tolerance levels.

Implications for policy makers

Our findings also provide important implications for policy makers, by highlighting the substantial costs firms face to serve government customers. This finding, in connection with our observation that a sizable percentage of publicly traded firms choose not to serve government customers, indicates that many firms recognize the high barriers in this marketplace. These barriers reward incumbents, thus resulting in a situation that may not represent the best stewardship of taxpayers' dollars. At the same time, the barriers make the incumbents more financially vulnerable. Thus, policy makers should consider reevaluating the federal procurement process because it may not be performing as intended.

Limitations and Research Directions

Several limitations arise in our research. Our sample includes only publicly traded firms, but privately held firms account for a sizable portion of awarded contracts, which could be explored in future research. Further research also might explore small to medium-sized firms to determine whether government relationships facilitate their entrepreneurial or marketplace efforts. These firms have access to federal funds specifically protected from competition. This situation offers some security but might cause issues for the firm subsequently: B2G marketplaces have an immense "valley of death" littered with firms that failed to survive as soon as they could no longer claim protected status (H.A.S.C. 112-99 2012).

Our sample includes only firms that received U.S. government contracts; continued research should explore the impacts of foreign government contracts. Perceived foreign government stability might determine the impacts of B2G relationships. This study does not account for firms that bid on but did not win government contracts; future research could focus on competition and the bidding process. In addition, future research should test how the federal government differs from commercial buyers; for example, the severity of the impact of federal contracting litigation or competitors' appeals could be examined. Federal procurement policy also has undergone significant changes in recent years. We sought to address these factors empirically, but further research should leverage quasi-experimental designs. For example, researchers could explore how the relationship between government emphasis and performance changes because of external shocks or policy changes related to the government's mission, regulations, oversight, or procurement scale (e.g., the Patriot Act, the Energy Policy Act). Moreover, our interaction effect of depth on firm value was not significant; it could be that our performance measures were not fine-grained enough to discern the benefits attained from closer connection to federal customers. Future research could explore additional metrics and conceptualizations around depth to see whether the effect is present. Lastly, future research may examine the impact of government customer emphasis on accounting measures that appear on the balance sheet or income statement.

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1 More precisely, gifts should not exceed $20 per source per occasion or $50 from a single source in any given calendar year, according to the Code of Federal Regulations §2635.204.

GO TO FOOTNOTE

2 As an illustration of the government's procurement capacity, consider that in 2018, Booz Allen Hamilton acquired a $621 million project from the Department of Homeland Security for cybersecurity services, and AT&T acquired a $993 million project from the Navy for mobility solutions, services, and devices (Washington Executive 2018). Commercial customers would struggle to match the scale and scope that the U.S. government offers to its suppliers.

GO TO FOOTNOTE

3 Federal agencies use the NAICS more widely than the Standard Industrial Classification System to categorize businesses.

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4 A general rule of thumb is that the number of instruments used in GMM estimation should be less than the cross-sectional sample size (i.e., number of firms in our study; Roodman 2009).

GO TO FOOTNOTE

5 We appreciate the guidance and suggestions of the review team on demonstrating the robustness of our results with different model and instrument specifications.

our results with different model and instrument specifications.

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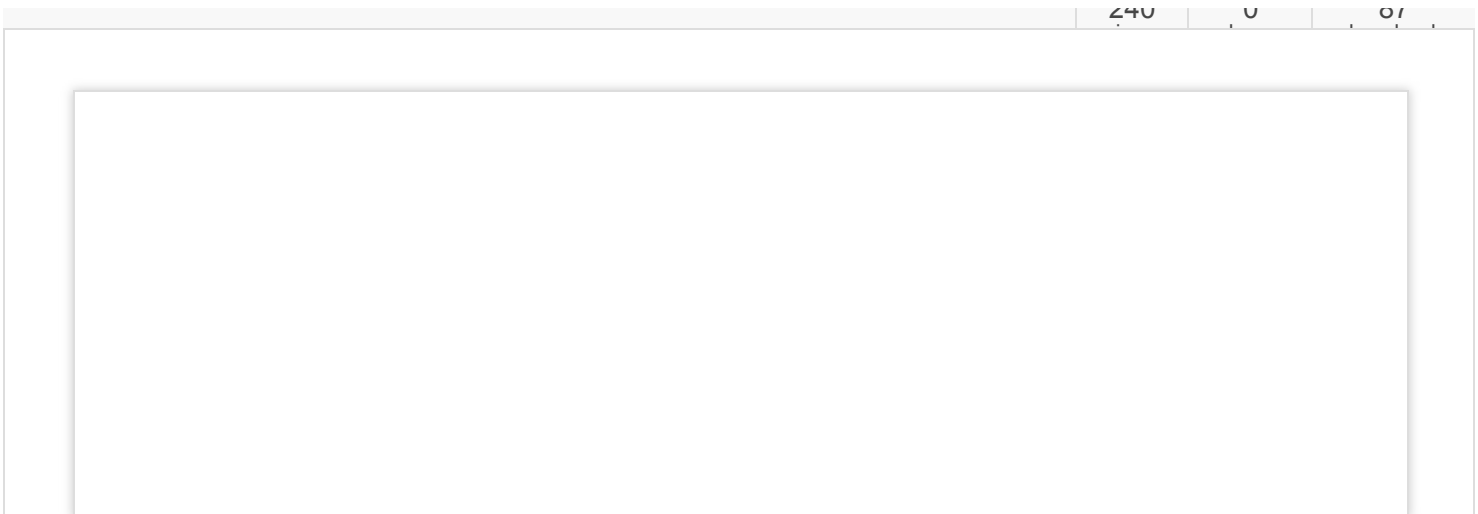
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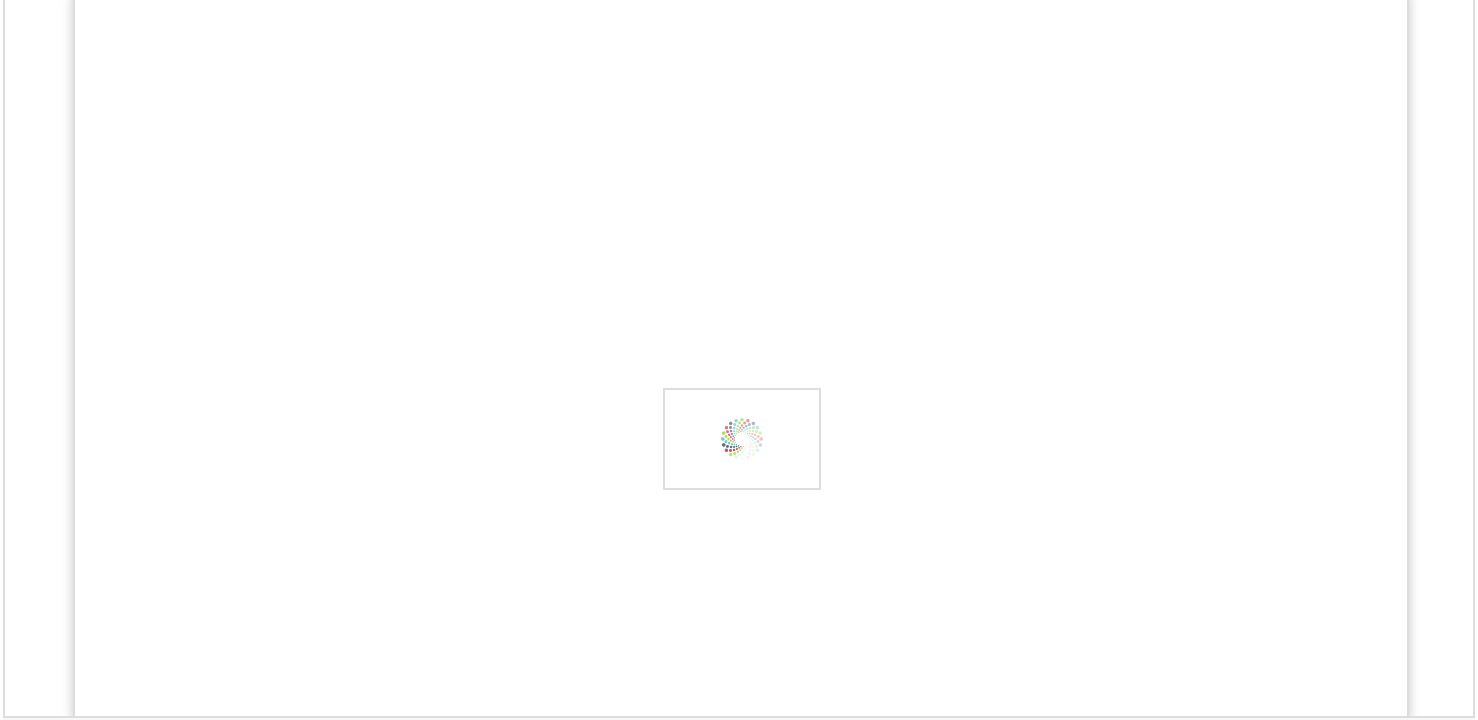
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