Resource, Relational and Institutional Antecedents to Renewal in Public-Private Partnerships

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ABSRACT

This study examines antecedents to the renewal of relationships between public agencies and private organizations. Specifically, we examine correlations between renewal and private firm resources and industry affiliations, previous experience partnering with the public entity, and the public entities institutional mandate such as the requirement to contract with historically disadvantaged firms and minority owned businesses. Utilizing a sample of primary contracts awarded by the Johnson Space Center, a NASA directorate located in Houston, Texas, we found that previous partnership experience, the industry of the private firm such as those in science and technology, and firms that operate in multiple industries are all more likely to have renewed relationships with the public entity. In addition, we found tentative support for minorities and underrepresented firms to also experience these renewed partnerships. Discussion, practical implications, and future research ideas are also presented.

Introduction

The debate over the appropriate delineation between services produced by public entities and not for profits versus that produced by private, for-profit firms is long standing. While no closer to resolution, recent years have witnessed a shift away from public goods to private goods (Warner, 2010). Even following the second deepest recession in the history of capitalism, renewed cries for deregulation and privatization persist (Pollin, 2010). While the whims of public favor may eventually change, public entities are increasingly tasked to utilize private, for-profit entities in the enactment of public policy goals.

The use of public-private partnerships to realize public policy goals is not, however, a recent phenomenon. Governmental agencies have long utilized private, for-profit firms for an array of services. In addition, policy makers realize that public investment in large and small, for-profit businesses provides both a research and economic incubator complementing private venture-capital (Audretsch,
2003; Peake, Marshall, & Preckel, 2007/2008). Further, the government has a lengthy history as a supplier of capital promoting the emergence of entrepreneurship in historically underrepresented minority groups (Cooper, 2003). Thus, the historical mandate and current economic polity combine, increasing the emphasis on the emergence and management of public-private partnerships.

In this environment, government agencies increasingly find themselves functioning as economic hubs, managing a network of contractor and subcontractor relationships. Thus, along with the technical knowledge specific to their mission, government agencies find alliance, vendor and partner management as a mandatory competency. In an increasingly privatized world, policy makers must identify the right provider of goods and services, maintain an efficient delivery on contracted terms, retain the best providers and meet policy goals.

Business strategy researchers recognize the importance of partner selection and partnership renewal (Gulati, 1998). Indeed, an array of alliance literature explores these and other issues critical to partner management (Ahuja, 2000; Hagedoorn, 1993, 2006; Kale, Dyer, & Singh, 2002). This research, however, is heavily biased towards partnerships between two or more for-profit entities. Even in examination of alliances within research intensive industries (Baum, Calabrese, & Silverman, 2000), the focus is on the for-profit firm. Thus, while we know a great deal about antecedents (Chung, Singh, & Lee, 2000; Eisenhardt & Schoonhoven, 1996; Gulati & Gargiulo, 1999) and consequences (Kale et al., 2002; Katila & Ahuja, 2002) of partner selection at the for-profit firm level, we know little about these factors from the perspective of the public or not-for-profit stakeholder.

While it is reasonable to expect that some research findings specific to for-profit businesses should generalize over to public entities, the mission differences for public organizations likely place additional demands and constraints on their performance. Therefore, while public firms – like private firms – should seek efficient partners, public firms – unlike private firms – will have to balance their
efficiency mandate alongside goals to incubate economic development. Recent research explores this second mandate of governments, and it is known that the federal government mandates efforts towards historically underrepresented (Cooper, 2003; Daniel, 2004; Reardon, Nicosia, & Moore, 2007) and small innovative businesses (Connell, 2009; Held, Edison, Pfleeger, Anton, & Clancy, 2006; Seong, Horn, & Held, 2008). However, at this time few – if any – studies examine this dual mandate and its partner renewal implications for government agencies.

The present study begins to address this research gap. We examine partnership renewal in a public-private context within a division of a government agency. Our examination looks at all for-profit firms awarded contracts by Johnson Space Center, a NASA division located in Houston, TX, from the period of 2005 to 2009. The 2005 to 2007 period is used as a base period and identifies characteristics of contract awards for this period. We then use those characteristics as a predictor of the receipt of future contracts in the 2008 and 2009 funding years. We cannot, in this study, offer insights into the contractor selection process for first awards, however we do, offer an understanding of sources of partnership renewal within a government contractor network after the receipt of first award.

The remainder of this paper consists of three sections. First, we examine relevant theory pertaining to alliance renewal in for-profit business partnerships. We extend this discussion, considering the dual mandate government agencies face in meeting their economic incubator mission. From this, hypotheses are developed predicting alliance renewal using relational capital, alliance, and institutional theories. The subsequent section details the study itself. We explain the data sources, collections and measures. We then continue with analysis of the data using logistic regression models. The final section of the paper discusses our findings and suggests implications for researchers and practitioners.
ALLIANCE RENEWAL

Strategy researchers identify a host of interorganizational relationships firms use in pursuit of their strategic goals. Koza and Lewin (1998) discuss both explorative and exploitative antecedents to interorganizational cooperation between firms. They suggest that firms choose interorganizational linkages both for efficiencies in achieving current competitive advantage and also for optimizing their search capabilities to identify sources of future competitive advantages. Accordingly, two distinct bodies of literature offer complementary and competitive theories of interorganizational linkages.

The transaction cost economic research stream stemming from the work of Coase (1937) and more prominently developed by Williamson (Williamson, 1999), argues that firms use interorganizational relationships when the good or service needed meets conditions of market efficiency. That is, when the good or service is not very specialized, not very ambiguous, and the need is of limited duration, the transaction costs of going to the market are lower than the transaction costs of managing production internally. Under these transactional conditions, the firm achieves its exploitative goals by using market efficiencies as a determinant of input costs.

Alliance researchers argue that, while TCE theory adequately predicts the make-buy decision for arms length economic activities, its prescriptions fail to identify conditions where cooperation between organizations maximizes the exploration potential of each partner. While the alliance-TCE debate becomes at times quite heated (Ghoshal & Moran, 1996; Williamson, 1996), there are reasons to see these bodies of literature as complementary. Gulati and colleagues (2000) observe that under conditions where transaction costs are too high to achieve bureaucratic benefits but when market efficiencies are also unlikely present, an alliance between firms makes sense. Here we find the explorative interorganizational relationship discussed by Koza and Lewin (1998). Under these
conditions, complementary specializations (Lavie, 2006) and idiosyncratic alliance capabilities (Larson, 1992) offer benefits not easily quantified under the transaction cost models.

Successful management of these interorganizational linkages is crucial to achieving organizational objectives. Brown and Eisenhardt (1997) find that developing and maintaining these networks are critical in realizing superior product portfolios. Rothaermal and Deeds (2004) similarly find that organizations managing large, complicated project portfolios prefer alliance structures. Kale and colleagues (2002) find that firms with more partner management experience achieve better market returns. Similarly, organizations with more partner management experience introduce more new products (Katila & Ahuja, 2002) and produce more patents (Nicholls-Nixon & Woo, 2003).

While the benefits of successful partner management are great, these benefits do not appear to accrue easily or quickly. Gulati and colleagues (2000) observe that relational capital between two alliance partners lowers the transaction costs associated with pairing, leaving future alliances less risky and more beneficial. Dyer and Singh (1998) concur noting that “cospecialization increases as alliance partners develop experience working together and accumulate specialized information, language, and know-how (pg. 662).” Hagedoorn (2006) observes that this accrued cospecialization increases the likelihood of repeated alliances between partners.

Collectively, our review suggests that organizations pursue interorganizational relationships for a variety of reasons. Some of these reasons, involving market-based efficiencies, are more likely to occur in arms-length economic transactions. In these cases, any future interaction between partners is likely the result of a bidding negotiating process where any number of potential partners may have won the contract. In other cases, though, the repeated pairings represent the organization’s search for partner benefits outside of the TCE efficiency framework. Because of the idiosyncratic nature of these
partnerships, repeated relationships between organizations are a result of ongoing needs. These needs are unlikely to be fulfilled by pairing with another firm.

Public entities pursue public-private partnerships for some of these same reasons. In pursuit of their primary mission, agency bureaucrats must identify private partners whose skill set meets the needs of the pairing. In some cases, these will be efficiency driven partnerships, which the TCE literature ideally describes. In such cases, when similar future needs occur, the public firm may – or may not – repeat its relationship with the initial private provider. In other cases, repeated pairing with a specific private provider may represent the ideal method of achieving agency mission objectives. In these cases, the public entity is highly likely to retain and renew services with the initial private provider. We develop these arguments into our first two hypotheses – built around theories of relational capital and contrasting TCE and alliance theories respectively.

Relational Capital

Partners accrue relational capital through repeated interaction in deep partnerships (Granovetter, 1985). As these relations develop, partners devote resources specific to the partnership enabling the emergence of idiosyncratic partner benefits (Dyer & Singh, 1998). Organizations are unlikely to devote unique resources to inconsequential partnerships, so generally the partnerships which create relational capital will be ones of significant investment and exposure. Granovetter (1985) confirms this, observing that while these embedded relationships develop trust and firm specific partner knowledge, the potential losses from opportunism in embedded relationships is profound.

Bouty (2000) notes that it is not the profitability of the relationship that determines embeddedness since even shallow and inconsequential partnerships can be profitable. He argues, rather, that the cost and depth of investment in embedded relations necessitates equitable benefits for the partners. These partners test themselves in early pairings and upon findings of equitability and
fairness, proceed into renewed partnerships with established trust. Indeed, trust based relationships developing over time is a common theme in relational capital theory (Lorenzoni & Lipparini, 1999; Park & Ungson, 2001).

Trust is not considered a characteristic in the arms-length economic transactions typical of TCE partnerships (Williamson, 1999, 2002). Because of this, and consistent with arguments presented by Bouty (2000), we believe that relational capital will not be a required component of small, inconsequential public-private partnerships. Rather, we expect that partners who receive large and numerous contracts represent partnerships in whom the risk of opportunism is higher. Further, when these high-investment relationships have proven successful in one time period, they are likely to be renewed in future time periods. Thus, we expect:

Hypothesis 1: Private firms receiving larger and more numerous contracts in one time period are more likely to receive future contracts than private firms who receive smaller and fewer contracts.

**TCE vs. Alliance Pairings**

In contrast to our relational capital arguments which are based on the level of investment in prior public-partner dyadic relations, our consideration in this section takes into account the nature of the good or service provided by the private partner. Under a TCE framework, goods should be outsourced when they are not specific, not ambiguous and where the need is not particularly prolonged (Hoetker & Mellewigt, 2009). In these conditions, efficient markets offer the potential for lower transaction costs in arms-length economic partnership.

By contrast when conditions suggest that an internal configuration mode would be ideal, but when the specific competencies do not lie within the public entity itself, the public provider is advised to select a private partner based on explorative rather than exploitative needs (Gulati et al., 2000). The private partner is thus likely to be specialized in such a manner that their capabilities are not easily
substituted or imitated (Barney, 1991). In such situations when the terms for the initial contract expire, should the public provider again need similar services, it is unlikely a different private provider will satisfy these needs. Facing highly ambiguous or highly specialized needs, such as those found in research firms, the public partner is less likely to identify a replacement business partner than in more commoditized contracts. Because of this, we expect:

Hypothesis 2: Private firms from industries which provide more specialized and inimitable services will have a greater likelihood of contract renewal than will private firms from industries with more commoditized services.

A related issue occurs when a private provider offers a portfolio of goods or services that become more difficult to imitate en masse. Here, while the individual services provided by the firm may themselves be relatively commoditized, the difficult to replace value comes from the breadth of the relationship. Having one vendor who provides multiple lines of goods or services enables the public entity to develop relational capital like advantages. In this case, the public partner benefits from both an alliance and relational context. The partner is difficult to replace and, having multiple lines of business served by the private partner, a greater likelihood for relational investment by the private partner exists. With this in mind, we expect:

Hypothesis 3: Private Firms who provide services across industry lines are more likely to have contracts renewed than firms who provide single services.

The Dual Mandate – Institutional Pressures in Public Private Partnerships

In our preceding sections, we considered public-private partnership renewal from the same perspectives one would expect in partnerships between for-profit firms. Here, however, we consider the second mandate facing administrators of government agencies. Not only must they effectively meet their agency’s primary mission, but they also have a responsibility to their dominant governing body to use public-private partnerships as an economic incubator for historically underrepresented firms.
A federal government mandate to stimulate activity for small and medium sized businesses has been in place for several decades (Audretsch, 2003).

In part, this is because such SME’s are recognized for their job creation and other economically stimulative effects (Connell, 2009; Lerner, 1999). Additionally, small businesses are recognized as optimal public partners because of their responsiveness and learning capabilities (Beekman & Robinson, 2004; Gelinas & Bigras, 2004). Specifically, programs like the Small Business Innovative Research (SBIR) program provides start-up funding for U.S. owned innovative SME’s and helps the federal government commercialize its sponsored research (Held, 2007; Held et al., 2006).

For SMEs owned by historically underrepresented minority groups, such as women-owned businesses and firms owned by male minorities, public private partnerships provide start-up and legitimizing funding difficult to acquire in capital markets (Cooper, 2003; Robb, 2002; Treichel & Scott, 2006). Recognizing these difficulties, the federal government has specific targets for direct contracts awarded to SME’s owned by historically underrepresented groups (Abramowicz & Sparks, 2007; Reardon et al., 2007). In addition to the direct value the private firm realizes through the public-private partner (Miller, Besser, & Riibe, 2006/2007), having the federal government as a business partner is a legitimizing force, providing institutional support in acquiring future contracts in the private sector (Lerner, 1999).

The general evidence suggests that these SME’s face institutional biases blocking them from private markets (Cooper, 2003), leading to excessive mortality rates (Robb, 2002). Thus, were we examining partnership renewal from a private firm standpoint, we might expect a reduced renewal rate for these firms – if, for no other reason, than the documented mortality differences. However, for these specific types of small businesses engaged in partnerships with an agency of the federal government, the institutional pressures work to their favor (Mick & Green, 2004). Mandated targets for direct
contract awards and additional resources provided to support the emergence of these firms suggest that such SME’s, having already received a federal contract, are more likely to remain in the public private partnership network (Held, 2007; Held et al., 2006). Because of this, we expect that:

Hypothesis 4: Small, private firms meeting the requirements for protected status in federal procurement contracts are more likely to have their contracts renewed than private firms not meeting these requirements.

METHODOLOGY

Data Gathering

The present study examines all direct contracts awarded to for-profit businesses by Johnson Space Center, a NASA directorate located in Houston TX, between the years of 2005 and 2009. As with other NASA directorates, JSC maintains an array of public-private partnerships servicing its ongoing mission as mission control for the Space Shuttle and the International Space Station. Additionally, it provides significant R&D contracts to private entities focusing on current and future missions. Finally, as with any government agency, it maintains a host of private partnerships providing ongoing operational and logistical support services in more mundane areas such as construction, janitorial services, training, landscaping and the like. The NASA Acquisition Internet Service (NAIS) provides information on all direct contracts awarded, by agency. Ad-hoc queries, by year, were conducted and records were retained for all direct relationships with for-profit firms in the period of interest. The NAIS database contains records for all awards generated by NASA directorates including procurement contracts and grants to both for-profit firms and not-for-profit entities such as Universities and municipalities. For purposes of this study, we only consider public-private partnerships and, thus, all public-public partnership data is omitted from subsequent analysis.

In this study, we examine whether firms who received federal contracts from 2005-2007 were additionally recipients of awards in 2008 and 2009. We use a multi-year window for both the base and
renewal period because many NASA contracts extend out beyond a single funding year. In these cases a firm may not receive a renewal in a subsequent year not due to lack of interest, but rather due to lack of closure in the prior contract. By using a thirty-six month base period and a twenty-four month renewal period, we capture both short and long-term contractual relationships between JSC and its private partners.

Since our interest lies in the continuance and renewal of existing relations, we do not consider the specific dollar value or number of contracts received in the 2008 to 2009 renewal period, merely whether a contract was extended to a firm who had received one or more contracts during the base period from 2005 to 2007. Because federal records track awards, not applications, we are unable to examine characteristics of firms winning first contracts – however using award-to-award data we are able to examine characteristics of renewal.

JSC maintains a large number of public-private relationships. We track 2377 organizations who had received contracts from JSC in the base period of 2005 to 2007. Of these, 1597 organizations received new contracts from JSC in 2008 to 2009. The base 2377 contracts represents roughly $92Bn in commerce. While much of the funds went to large businesses, particularly those involved in ongoing projects with ISS and the Space Shuttle, 1302 small businesses are profiled in our data, 288 being of historically underrepresented ownership.

The majority of contracts are awarded to firms in NAICS 54 – science and engineering. Indeed, the single largest category of awards finds 14% of all contracts going to firms in NAICS 541710, which includes firms involved in R&D for physical and life sciences. Other than NAICS 54, NAICS 33 – manufacturing is also well represented, with NAICS 334111 computer manufacturing receiving 5% of all contracts. Most six-digit NAICS codes receive fewer than 2% of all contracts suggesting a rather good dispersion of investment across multiple industries.
Measures

Our dependent variable in all subsequent analysis is renewal of the public-private partnership. This is a binary variable scored as a 1 if a firm received contracts in the base period (2005-2007) and additionally received at least one contract in the new period (2008-2009). If a firm received a contract in the base period, but did not receive a contract in the new period its renewal value is scored as a 0. While a number of organizations received contracts in the renewal period who did not receive contracts in the base period, we do not use these firms in our analysis. Lacking details on the various firms competing for the contract the new firm received, we are unable to make any significant examination of characterizations for these new partnerships.

Hypothesis 1 predicts that partnership renewal is more likely when the private partner represents a large investment for the public agency. In such cases, the investment in the base period is significant enough to warrant investment in partner-specific resources. The outcome of such investments is the accrual of relational capital between the public-private pairing, capital which loses value if the relationship does not persist. We use two variables as predictors for this test. The first is past contracts, a count variable capturing all contracts awarded to the private entity during the base period. The second variable is past dollars, the log-value of the sum of all contract awards during the base period. In each case, H1 predicts a positive relationship between the predictor and the likelihood of partnership renewal.

Hypothesis 2 predicts that partners coming from industries characterized by idiosyncratic capabilities are more likely to renew relationships than partners coming from more commoditized industries. Here, we base our prediction on the predictor NA54, a binary variable recording whether the private partner provided contracting work for contracts awarded to NAICS 54 firms. NAICS 54 is science and engineering, characterized by research and development firms. While there is competition in these
industries, firms develop idiosyncratic skill-sets based on the human capital they retain. Further, such firms often compete on the basis of protected patents, making it less likely that an NAICS 54 firm is easily imitable or replaceable than for firms in other industries. To supplement analysis for H2, we also provide the dummy variables NA33 and NA23 which capture firms providing services in the manufacturing and construction industries respectively. H2 predicts that a positive relationship will exist between the NA54 dummy variable and the likelihood of that firm experiencing partnership renewal with JSC.

Hypothesis 3 explores the relationship between the degree of a private partner’s breadth of services and the likelihood of renewal of the public-private partnership. Here we use the predictor generalist, which is a count variable measuring the number of different two-digit NAICS codes a firm serviced contracts for during the base period. The higher the value for the generalist indicator, the more distinct two-digit NAICS codes the firm services. Diversified firms, who compete in multiple industries, are more difficult to replace in a public-private partnership than a specialist firm who provides services in only one industry. Indeed, for the generalist firm who provides services in three or more industries, it could take three or more specialist firms to match the services should the public entity fail to renew the public-private partnership with the generalist firm. H3 predicts a positive relationship between the generalist measure and the likelihood of that firm renewing its partnerships with JSC.

Hypothesis 4 explores the institutional pressures likely to reinforce continuing relations with small businesses meeting criteria for targeted treatment in government procurement contracts. Here we use four binary variables: WOB (women-owned businesses), DIS (disadvantaged businesses), 8(a) DIS (8 (a) disadvantaged firms), and SBIR (small business innovation research firms). These are categories of small businesses with specific targets in federal procurement programs. The specific definitions for
these types of firms can be found through the Small Business Administration website. Consistent with federal procurement guidelines, NASA’s NAIS database tracks contractors based on their meeting and applying under these specified programs. H4 predicts a positive relationship between small-business status for the private firm and the likelihood of contract renewal of JSC partnerships.

ANALYSIS AND RESULTS

Analysis of our data was prepared using PASW-18, the most recent iteration of the SPSS statistical package. We present output using correlation analysis and logistic regression across two sets of data. The first set of data uses records for all for-profit firms who received contracts in the base-period. This includes both large and small businesses and distinguishes for business size using the binary variable SMBus. This data set for these 1785 firms is used to test H1-H3.

We produce a subsequent analysis using only firms which the NAIS database lists as meeting small business definitions. These 1302 firms consist of women-owned businesses (WOB), disadvantaged small businesses (DIS), 8(a) disadvantaged small businesses (8(a) DIS), small business innovation research firms (SBIR) and non-minority owned small business. The small business data set is used to test H4 specifically; however the same predictors used in H1-H3 are included. To this end, we can compare results for H1-H3 for all businesses and, specifically, for small businesses.

Correlations for all variables in the first data set for all businesses, appears in Table 1 below. Of specific interest, the various hypothesized relationships appear supported. Supporting H1, correlations between renewal and both past contracts ($r = .25$) and past dollars ($r = .32$) are positive and significant. Supporting H2, the correlation for renewal and NA54 ($r = .19$) is positive and significant. Additionally, while the correlation between renewal and NA 23 ($r = .07$) is positive and significant, both it and the correlation for NA33 ($r = .03$) are far weaker than that for NA54 and renewal. Supporting H3, the correlation between renewal and generalist ($r = .45$) is positive and significant – indeed, this is the
strongest correlation to renewal in the full data set. Among other measures, as might be expected, large businesses are slightly more likely to be generalists than small businesses (r = -.05). Small businesses also receive fewer contracts (r = -.08) for fewer dollars (r = -.20) than do large businesses. Small businesses are no more, nor less, likely to come from science and engineering (r = .05), construction (r = .02) or manufacturing (r = .01) than large businesses. (See Appendix Table 1)

Correlations for small businesses appears in Table 2 (See Appendix). Our primary focus for this analysis involves H4. Here we find tentative support in the correlations, with the correlation between renewal and disadvantaged (r = .10), 8(a) disadvantaged (r = .13) and SBIR (r = .10) all positive and significant. Interestingly, the correlation for women owned businesses and renewal is nonexistent (r = .00). Additionally, results for H1-H3 appear similarly supported in the small business only dataset. Disadvantaged firms (r = .10), 8(a) disadvantaged firms (r = .11) and SBIR firms (r = .15) are each more likely to be generalists than other types of small businesses. 8(a) disadvantaged firms (r = .10) and, unsurprisingly, SBIR (r = .58) firms are more likely to perform science and engineering work (NA54) as well. Consistent with past research (Robb, 2002), disadvantaged (r = .17) and 8(a) disadvantaged (r = .27) are more likely to perform construction functions (NA23). Women-owned businesses are not correlated strongly with our dependent variable, nor do they appear concentrated in any of the three targeted industries. However, disadvantaged (r = .10) and 8(a) disadvantaged (r = .08) firms are likely to also be women-owned while SBIR (r = -.05) are marginally less likely to be women owned.

(See Appendix Table 2)

Examination of the hypotheses was conducted using logistic regression with variables entered in hierarchical blocks respective to each hypothesis. At each stage, we provide the -2 log likelihood and the Nagelkerke R² for the model. The significance of predictor variables, along with changes to -2 log
likelihood and R², provides the evidence for support, or non-support, for each hypothesis. At each stage of the analysis, we provide the odds ratio as the coefficient.

Examination of H1-H3 was conducted using the analysis set of all for-profit businesses winning contracts with JSC during the base period. The dependent variable for the analysis is renewal, which is a 1 if the firm received a new contract from JSC in 2008-2009 and otherwise a 0. Results of the hierarchical logistic regression appear in Table 3 (See Appendix). The overall model explains roughly 36% of the variance, and H1-H3 receive support in this analysis. Consistent with our expectations for H1, both past contracts (β = 1.08) and past dollars (β = 1.37) are significant predictors of renewal. As expected, the odds of a firm renewing their public-private partnership increase based on the number of contracts and dollars awarded in the base period. Additionally, these two predictors account for roughly 17% of the variance explained in the model. Consistent with H2, NA54 (β = 1.90) is a significant predictor of renewal. Again, the odds of a firm renewing their public-private partnership with JSC increase if that firm provided NA54 services in the base period. Also, consistent with our H2 expectations, odds neither significantly improve, nor worsen if the firm provided manufacturing (β = 1.30) or construction (β = 1.00) services. Consistent with our expectations for H3, being a generalist (β = 28.36) dramatically increases the likelihood of renewing a public-private partnership with JSC. Inclusion for our predictors for H2-H3 adds roughly 19% to the variance explained by the model. Of note, inclusion of a predictor for firm size (β = .96) provides no improvement on the overall quality of the model. (See Appendix Table 3)

To examine H4, we compared results specifically for all small businesses. This analysis appears in Table 4 (See Appendix). We provide a hierarchical logistic analysis similar to that used in Table 3, here the full model explains roughly 37% of the variance. For H4, we expected that firms meeting requirements for federal procurement targeted programs would be more likely to experience contract
renewal than other small businesses. Here our findings are mixed. SBIR firms (β = .44) are actually less likely to have contracts renewed and disadvantaged businesses (β = 1.69) are only marginally more likely to receive contract renewal. However, neither women-owned businesses (β = .86) nor 8(a) disadvantaged businesses (β = 1.34) are more – nor less – likely to receive contract renewal. Given these mixed findings, we conclude that H4 is not supported. (See Appendix Table 4)

Further examination of the results in Table 4 offers some explanation for the non-support of H4. Interestingly, H1-H3 would be supported were we to only analyze small businesses. The more contracts (β = 1.08) and the more dollars (β = 1.52) a small business received in the base period, the more likely they were to renew in 2008-2009. Additionally, small science firms (β = 2.75) and generalists (β = 37.66) are substantially more likely to receive contract renewal. In our correlation analysis, we observed that women-owned businesses were no more, nor less, likely to be science firms or generalists, nor were they likely to receive numerous or large contracts than other small businesses. From this, and given our regression model, it appears that women-owned businesses succeed or fail to remain in network solely by whether or not they provide services highly likely to retain contract renewal. Additionally, our correlation findings suggest that disadvantaged and 8(a) disadvantaged firms receive somewhat more and larger contracts than other small businesses and are slightly more likely to be generalists than other small businesses. Thus, while we find that 8(a) firms are modestly more likely to receive contract renewal overall, the bulk of the renewal story for disadvantaged small businesses stems from relational advantages. Finally, while SBIR firms are found to be less likely to receive contract renewal, our correlation analysis suggests that SBIR firms are overwhelmingly science and engineering firms that do receive above average rates of contract renewal. Thus, the slightly negative renewal rate for SBIR firms likely results from inter-correlation with NA54.
DISCUSSION, IMPLICATIONS AND CONCLUSION

We conducted this study to examine antecedents to public-private partnership renewal within the JSC contractor network, and we expected to find relational, alliance and institutional forces affecting partnership renewal. Our results support relational and alliance theories but do not specifically support institutional theory. While this is somewhat surprising given government targets towards specific small-business ownership, our findings at a glance appear consistent with other studies that suggest that the federal government regularly falls below its targets for historically underrepresented firms (Reardon et al., 2007).

However, another possible explanation also is suggested by our analysis. We find strong support for contract renewal for science and engineering firms and also for generalist firms. To the extent that these targeted small businesses are themselves also science firms and generalist firms, their network renewal stems more from the services they provide than for the categorization of their ownership. Additionally, we observe that certain targeted groups received more and larger contract rewards in the base period. As these two predictors themselves are strong predictors of contractual renewal, targeted firms are less likely to win renewal based on their targeted status, but rather based upon the relational capital established in prior contracts.

Taken together, this suggests that JSC may have succeeded in combining their dual mandate. Overall, public-private partnership renewal for JSC is consistent with our expectations under relational and alliance theories of partnerships. Partners with greater initial commitments and partners who provide services not easily duplicated are more likely to renew than are partners providing trivial or easily duplicated services. In this regard, JSC’s public-private partnership network is not unlike that of private-private partnership networks.
It is possible that JSC has merged their dual mandate of economic incubator with their overall mission. Where possible, they have identified historically disadvantaged firms who provide difficult to replicate services. JSC also invests heavily in these relationships and builds relational capital with these firms. Collectively these actions ensure a greater likelihood of partnership renewal and quite likely increasing the survivability of such enterprises relative to firms from similarly economically disadvantaged backgrounds.

Our findings are consistent with literature on private-private partnerships. This suggests some generalization for current alliance and relational capital theories in their extension towards research in public-private partnerships. No research is without limitations however and we believe there are three such areas with our present study.

First, we address public-private renewal which may not reflect performance for the alliance or partner organizations. Indeed, while Gulati (1998) observes that partnership renewal/continuation represents one means of analyzing alliance success, there are specific cautions one should take when treating renewal as success. Some partnerships persist despite failing to achieve results and some partnerships terminate upon achieving performance. Thus, while renewal and continuance are important performance metrics from a relational perspective, they should not be mistaken for mission performance indicators.

Second as with most archival studies, we are limited given the data available. While we argue that NAS4 (science and engineering) firms are more likely to provide idiosyncratic services not easily replicated, this is an argument based off of theory and not one we can confirm with specifics of the contracts or bids. While the NAIS database provides general information on the contracts, given the classified nature of many of these projects we understandably lack detail needed to determine which NAS4 contracts are idiosyncratic and which are standardized. The results of our study suggest that, on
balance, NA54 firms are more idiosyncratic – a fact that is unsurprising given the research mission of JSC. Ultimately we believe that additional data on contracts would refine, but not change, our results.

Third, while our results are in line with partnership research for private firms, our analysis period is one of relative stability for JSC. Our base period involves one presidential term. While the renewal period straddles two presidencies, the period does not involve one where substantive mission change occurs. Given the controversies and mission debate surround NASA’s 2010 budget and ongoing mission we cannot conclude that our findings would obviously generalize across such a period of change. Indeed, cancellation of all or major portions of the Constellation project alone will likely involve cancellation (or failure to renew) relationships with a number of NA54 (science) and NA33 (manufacturing) firms. It may be that, following this shake-up, the non-generalist firms and providers of standard services (e.g. NA23 construction) have better in-network survival rates. To that end, our results cannot be generalized towards periods of major environmental change. Subsequent analysis once the current budget controversies are resolved represents fertile future research.

Our results suggest two implications for managers of private firms seeking to maintain partnership status with public entities. First, it is beneficial to provide idiosyncratic and mission critical goods or services not easily replicated. In our analysis, firms coming from NA54 are more likely to achieve contract renewal than other firms. Given the overall science and exploration of NASA, this is not surprising. Such firms meet the mission needs and science and engineering firms are, in general, less substitutable between competitors than firms in other industries (e.g. retailers).

Our second recommendation is to provide an array of services which, as a package, make your firm less substitutable and replaceable. Not every contract awarded by public entities will go to firms providing mission specific and highly specialized services. Some needed services are, by nature, more easily substitutable. If your firm provides such easily replaceable services, bundle together multiple
services and business lines. Thus, even where each piece of your portfolio may be replaceable, in total few may match your services. Further, having a diversified portfolio of services provided also offers a buffer to retain public-private partnerships even when losing some pieces of the relationship in future award-cycles.

For administrators of public agencies, we find two similar implications for meeting their dual mandates. First, whenever possible, identify, retain and nurture historically underrepresented firms who provide mission-critical, highly specialized services. For JSC, that appears to be NA54 firms where analysis for all firms finds slightly positive correlations between NA54 and disadvantaged and 8(a) disadvantaged firms. Assuming these firms maintain appropriate deliverables, their ability to provide not-easily replicated services makes it more likely that they can remain in network – allowing JSC to meet their mission and incubator objectives simultaneously.

Second, when the historically underrepresented firm does not provide highly specialized, mission-critical services, try to develop support services that help the small business grow into a more sophisticated, diversified firm. Such firms are far more likely to remain in network than non-generalized firms who do not provide specialized services. This suggests that the procurement arm for government entities needs to maintain involvement in networks providing developmental services for historically underrepresented SME’s.

Returning to our first implication for public administrators, identifying strategically specialized SME’s is unlikely an easy task. Past research suggests that historically underrepresented businesses tend to be disproportionately engaged in less specialized industries such as construction (Robb, 2002). Indeed, our own results suggest that both types of disadvantaged firms have stronger correlations to construction than to sciences. Our results suggest weak to no positive correlations for disadvantaged and women-owned businesses and science and engineering firms. Further, given that other research
suggests that more Americans on whole (and minorities in particular) are forgoing pursuit of science and engineering degrees (Gates, 2010), these findings combine to paint a rather dire picture of the future. Since these businesses tend to grow faster and produce better incomes for their workers (Audretsch, 2003) than other businesses, the current status and future trends suggest increased difficulties for American owned historically underrepresented businesses.

In closing, public entities face multiple objectives in development of public-private partnerships. In addition to their mission objectives, each agency serves a dual mission with economic incubator expectations for their local area. Our research complements and extends public-private partnership research, demonstrating that theory derived in alliance and relational capital research for for-profit firms has bearing in public-private partnerships. Additionally our results for this specific entity suggest that public entities can merge their dual objectives in achieving renewal and continuance of public-private partnerships.
### Appendix Table 1

*Descriptives and Correlations for all businesses*

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Note.  *** Correlations are significant at the .001 level (2-tailed);  ** at the .01 level;  * at the .05 level; †at the .10 level
Appendix Table 2

Descriptives and Correlations for Small Business Only

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Note.  *** Correlations are significant at the .001 level (2-tailed);  ** at the .01 level;  * at the .05 level; †at the .10 level
Appendix Table 3

*Logistic Regression DV = Renewal all for profit firms*

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Note: *** \( p < .001 \)
Appendix Table 4

Logistic Regression $DV = Renewal\ all\ Small\ Business$

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Log Likelihood: 1328.97 1120.169 1109.4
Nagelkerke R2: 0.17 0.364 0.37

Note: *** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .10$
REFERENCES


