Business Value in Public-Private Partnerships

The Positive Impact of Trust and Task-Relevant Competencies on Business Outcomes in PPPs

Brogaard, Lena

Published in:
International Public Management Journal

DOI:
10.1080/10967494.2018.1457107

Publication date:
2019

Document Version
Peer reviewed version

Citation for published version (APA):
Brogaard, L. (2019). Business Value in Public-Private Partnerships: The Positive Impact of Trust and Task-Relevant Competencies on Business Outcomes in PPPs. *International Public Management Journal*, *22*(4), 617-642. https://doi.org/10.1080/10967494.2018.1457107

International Public Management Journal

ISSN: 1096-7494 (Print) 1559-3169 (Online) Journal homepage: http://www.tandfonline.com/loi/upmj20

Business Value in Public-Private Partnerships: The Positive Impact of Trust and Task-Relevant Competencies on Business Outcomes in PPPs

Lena Brogaard

To cite this article: Lena Brogaard (2018): Business Value in Public-Private Partnerships: The Positive Impact of Trust and Task-Relevant Competencies on Business Outcomes in PPPs, International Public Management Journal, DOI: 10.1080/10967494.2018.1457107

To link to this article: https://doi.org/10.1080/10967494.2018.1457107

Accepted author version posted online: 26 Mar 2018.

Business value in public-private partnerships: The positive impact of trust and task-relevant competencies on business outcomes in PPPs

Lena Brogaard

Social Sciences and Business, Roskilde University, Roskilde, Denmark

Address correspondence to Lena Brogaard, Social Sciences and Business, Roskilde University, Universitetsvej 1, 4000 Roskilde, Denmark. E-mail: brogaard@ruc.dk

ABSTRACT

Governments and businesses enter public-private partnerships (PPPs) to achieve better outcomes, but successful partnerships are not easily accomplished. Because businesses' expectations about PPP outcomes affect how and whether they participate as partners, managing PPPs effectively requires knowing not just what governments loose or gain, but also the value businesses receive. The article demonstrates how structural, collaborative and participant factors associated with both public and private partners affect business value in PPPs. Based on a mixed methods approach, this study tests four hypotheses on how PPPs influence value creation for businesses. The findings show that PPP experience, trust and PPP size have significant effects on business value. However, they only increase certain types of value, depending on the presence and performance of other factors. Moreover, the results show that businesses gain more intangible values such as network development and knowledge than revenue.

KEYWORDS: business value, collaborative value, network governance, public-private partnerships

Introduction

In recent years, a growing trend towards focusing on cross-sector collaboration has spurred the question of what organizational and societal value partnerships between governments and businesses produce, what are often called public-private partnerships or PPPs (Page et al. 2015). The rationale behind PPPs is that they create value in the form of outcomes that the partners cannot achieve individually (Steijn, Klijn, and Edelenbos 2011; Vangen and Huxham 2012). Value creation entails different types of benefits for the public and private partners through risk sharing and by combining resources and competencies (Steijn et al. 2011; Kivleniece and Quelin 2012). However, successful partnerships are not easy and value for either or both partners is far from guaranteed. Moreover, evaluations of PPP outcomes often focus solely on public value (Andrews and Entwistle 2010; Edelenbos and Klijn 2009; Reynaers 2014). This perspective does not take into account that managing PPPs effectively requires knowing not just how the public partners gain or lose value, but also the value businesses receive (Kivleniece and Quelin 2012; Cabral, Lazzarini, and de Azevedo 2013). The increasing involvement of private actors in innovating, producing and delivering public services necessitates more knowledge on how PPPs create business value as an outcome of and driver for future partnerships (Murphy, Arenas, and Batista 2015).

Recent public management literature has acknowledged the need to address value in PPPs, focusing on how to improve public value (Girth 2014; Carpintero and Petersen 2014; Boyer, Van Slyke, and Rogers 2016). Within the literature on strategic management, Business Policy and Strategy and Social Issues in Management represent established fields for examining and theorizing

different types of business value (Amit and Zott 2001; Agle and Caldwell 1999). Meanwhile, business value in PPPs constitute a limited focus (e.g., Kivleniece and Quelin 2012; Cabral et al. 2013). Public and strategic management scholars have thus so far largely overlooked the issue of business value in PPPs and the potential in combining their insights to further this agenda (Mahoney, McGahan, and Pitelis 2009; Van Der Wal, De Graaf, and Lasthuizen 2008).

The purpose of this article is to shed light on business value in PPPs by addressing the following research question: *How do participant competencies, collaborative process and structural factors influence value creation for businesses in public-private partnerships?* Combining public and strategic management literature to study business value in PPPs demonstrates how factors associated with both the public and private partners, such as mutual trust and PPP size, affect business value. Moreover, examining business value in PPPs shows which factors to prioritize to increase different types of value. The study thereby provides insights on how to effectively design and manage PPPs to create business value and avoid situations where value is created for only one or neither partner at the expense of the other (Brinkerhoff and Brinkerhoff 2011; Chen, Hubbard, and Liao 2013; Carpintero and Petersen 2014; Kivleniece and Quelin 2012).

The empirical focus of this article is PPPs specifically oriented towards innovating public services in healthcare and eldercare, where there is a growing demand for new solutions to increase efficiency. Based on a mixed-methods design, the article tests four hypotheses using data from a survey distributed among 260 PPPs and a comparative study of eight PPPs in Denmark. Danish governments have been using and promoting PPPs as an innovation tool for nearly a decade. PPPs can add value in areas such as healthcare and eldercare were collaboration with private businesses provide technical expertise for the development of new solutions. As a Scandinavian country characterized by a large public sector and comprehensive welfare system, the lessons from the Danish

case are applicable to other Nordic and some OECD countries with a similar need for and challenges related to PPPs.

The next section presents the theoretical framework, which combines the strategic and public management literature to conceptualize business value, and formulates four hypotheses regarding the influence of innovation training, PPP experience, trust and PPP size on business value. The third section presents the mixed-methods design, the survey and case studies. Section four reports the survey and case study results. Finally, section five discusses and concludes on the findings with implications for research and practice alike. Overall, the study shows that PPP experience, trust and PPP size have significant effects on value creation. However, they only increase certain types of business value and their influence depends on the performance of other factors.

Theoretical Framework: Business Value in PPP

PPPs can be defined as interdependent public and private actors collaborating to develop mutual products and services, and where risks, costs and benefits are shared (Edelenbos and Klijn 2007; Steijn et al. 2011; Kivleniece and Quelin 2012). By combining their efforts, the partners can achieve better outcomes than they could achieve individually (Bryson, Ackermann, and Eden 2016). More specifically, value creation in PPPs concerns those "*benefits relative to the costs that are generated due to the interaction of the collaborators and that accrue to organizations, individuals and society*" (Austin and Seitanidi 2012a:728). Value thus constitutes both broader social benefits and organizational benefits that the partners strive to gain (Cabral et al. 2013; Kivleniece and Quelin 2012). The focus of this study is on specific business benefits attributed to the partnership (Murphy et al. 2015). Because business value varies in nature and number, this study furthermore examines three types of values, which categorizes cited business benefits in the strategic and

management literature (Amit and Zott 2001; Agle and Caldwell 1999; Austin and Seitanidi 2012a, 2012b). First, *transferred value* is the financial resources gained from the PPP, among other things market development and customers (Edelenbos and Klijn 2007; Brinkerhoff and Brinkerhoff 2011; Kivleniece and Quelin 2012). Second, *synergistic value* constitutes those innovative benefits that come from new products and modes of production (collaboration) that are essential for business innovation (Lepak, Smith, and Taylor 2007; Steijn et al. 2011; Teece 1992). Finally, *interaction and associational value* are the intangible benefits regarding the business' external relations, such as reputation, knowledge and access to government agencies (Austin and Seitanidi 2012b; Murphy et al. 2015; Lepak et al. 2007).[1]

Hypotheses: Factors influencing business value in PPP

Several factors at the participant, collaborative and structural level affects business value in PPPs (Ansell and Gash 2008). At the participant level, PPP experience and innovation training are task-relevant competencies that enable the partners to develop new products or services and navigate a collaborative process with partners from different sectors (Winter 2003; Provan and Kenis 2008). This collaborative process is, in turn, more likely to create value for the businesses based on mutual trust between the partner organizations, which facilitates coordination and risk sharing (Klijn, Edelenbos and Steijn 2010). Finally, a structural aspect of any PPP is the number of partner organizations involved, which can affect the distribution of benefits (Ansell and Gash 2008; Hoang and Antoncic 2003). The subsequent sections define and elaborate on each factor.

Task-relevant competencies: Innovation training and PPP experience.

Partners enter PPPs for resources from others that are different from one's own (Austin and Seitanidi 2012a; Alexander 2012). As a part of those resources, key competencies are important to ensure productive partners (Bryson, Crosby, and Stone 2015; Emerson, Nabatchi, and Balogh 2012). However, the value of specific competencies depends on the goal and nature of the participants' tasks (Provan and Kenis 2008; Crosby, 't Hart, and Torfing 2016). In an innovation-oriented PPP, task-relevant competencies are innovation training and PPP experience. These skills help the participants address more efficiently tasks or problems related to the development of new solutions in a cross-sector partnership.

Innovation training, acquired through courses and education, enhances value creation by enabling the participants to manage the innovation process, idea generation and implementation (Bland et al. 2010). Innovation training does not imply that these individuals are more innovative, but rather that they possess the skills to facilitate the development of new solutions, which increases the likelihood of value creation. Experience with PPPs likewise provides an important source of knowhow and capacity and is likely to lead to better performance through greater alignment of goals and strategies (Bryson et al. 2015; Murphy et al. 2015). These different skills constitute a form of dynamic capabilities, which entail the capacity to renew the business' competencies to respond to developments and produce change to gain a competitive advantage such as new product development (Winter 2003; Teece, Pisano, and Shuen 1997). The first two hypotheses evaluate the impact of innovation training and PPP experience among the participants on business value in PPPs.

H1: Participants with innovation training increases the likelihood of value creation for businesses in PPPs.

H2: Participants with PPP experience increases the likelihood of value creation for businesses in PPPs.

Trust

Trust increases the predictability of actors' behavior, which reduces transaction costs and enhances value for the partners (Edelenbos, Klijn, and Steijn 2007; Rufin and Rivera-Santos 2012). Trust is the willingness to be vulnerable to the actions of others due to a positive expectation that they will act as agreed and in the interest of the partnership (Mayer, Davis, and Schoorman 1995; Edelenbos and Klijn 2007). Four dimensions furthermore capture how and to what degree the partners trust each other. First, ability is the perception of the other partner's competencies, if they can perform the needed tasks in the partnership (Mayer et al. 1995). Secondly, benevolence is whether the partners believe each other to have only their own self-interest in mind (Edelenbos et al. 2007; Mayer et al. 1995). Integrity concerns whether the partners can expect one another to do what has been agreed (Edelenbos et al. 2007; Mayer et al. 1995). Finally, as the partners come from different sectors, they might lack a basis for mutual understanding and prior interaction, which complicates the development of trust in a PPP (Rufin and Rivera-Santos 2012). Frequent interaction thus helps facilitate trust building through direct dialogue (Ansell and Gash 2008).

Trust increases public value in PPPs (e.g., Klijn, Edelenbos, and Steijn 2010a; Ysa, Sierra, and Esteve 2014), but whether trust likewise leads to different types of business value in PPPs, and thus should be prioritized, is unclear (Cabral and Krane 2016). The assumption is that developing new products and networks are benefits that contracts alone cannot ensure. Trust mitigates conflict and induces partners to partake in risky innovation processes, where the outcomes are

uncertain (Klijn et al. 2010). The third hypothesis evaluates the impact of trust on business value in PPPs.

H3: Higher levels of trust among the partners increase the likelihood of value creation for businesses in PPPs.

PPP size

Value creation in PPPs takes place within a pre-defined structure of two or more partners. The number of partners involved in a PPP can vary from one public and one private entity to several organizations from different sectors (Hodge and Greve 2013). More partners, in turn, potentially mean higher complexity in governing relations, building trust and a wider distribution of benefits (Provan and Kenis 2008; Klijn and Teisman 2003). The size of the PPP can thus have a positive or negative impact on value creation, e.g., by leading to higher coordination costs (Alexander 2012). In a homogenous group of similar organizations, a higher number of partners do not necessarily pose a challenge to value creation. However, a PPP represents a heterogeneous group because the involved partners come from different sectors and thus represent diverging and sometimes conflicting interests, goals and value systems (Kivleniece and Quelin 2012; Ysa et al. 2014; Weihe 2008). Consequently, the number of partners in a PPP can reduce the benefits gained by businesses, which makes it necessary to take the full scope of partners into consideration to assess performance (Alexander 2012). The final hypothesis evaluates the impact of the PPP size on business value creation in PPPs.

H4: A partnership with fewer participating organizations increases the likelihood of value creation for businesses in PPPs.

Research Design and Methods

The study uses a mixed-methods design of innovation-oriented PPPs in Danish healthcare and eldercare consisting of qualitative data from a comparative case study of eight PPPs and quantitative data from a survey of 260 PPPs (Leech and Onwuegbuzie 2007). The survey data tests the hypotheses statistically across a large number of cases, while the case studies provide a more nuanced understanding of the hypothesized factors. Moreover, the two methods cross validate findings (Wang 2016).

The empirical setting of the study is Denmark, where government agencies have actively promoted PPPs since 2009 as a way of innovating and improving public services (Danish Enterprise and Construction Authority 2009). The need for new solutions, especially within cost-intensive and complex areas such as healthcare and eldercare, requires collaboration with private businesses possessing the necessary technical expertise.

Survey study

The data on businesses in the quantitative part of this study are a part of a larger survey on innovation-oriented PPPs in Denmark. As no list or overview of this type of PPP in Denmark existed prior to this study, two researchers identified businesses participating in PPPs through review of reports and websites of relevant public organizations and businesses known to fund or participate in PPPs. Furthermore, key people at local, regional and national level were contacted for additional information. All partnerships identified in this process were sorted and assessed to ensure that they qualify as PPP based on participation of both public and private entities and that innovating public services was the main purpose. Two hundred and forty-nine PPPs were initially selected, with more partnerships added as a part of the process of identifying respondents. In total,

260 PPPs made the final list for the survey, which represents the entire known population of innovation-oriented PPPs in Danish healthcare and eldercare.

The survey was distributed in early 2015 to 246 business respondents from the list of PPPs.[2] In total, 124 respondents participated in the survey and only 89 of them completed the survey, likely due to a somewhat lengthy questionnaire (see **Table 1**). The final number of observations used in the analysis is 76, as cases in which the respondents' answered 'don't know' are excluded.

As the limited sample size suggests, it was not possible to identify a business respondent from all 260 PPPs or all named participating organizations in each PPP.[3] Instead, the respondents constitute the most involved individuals such as project leaders, technical managers and company CEOs, who are the most knowledgeable of the partnership. The respondents primarily represent PPPs within healthcare and eldercare with only a few in other types of services such as education and childcare. The limited sample calls for caution in interpreting and generalizing the findings of the quantitative analyses, which are expected survey risks, especially when embarking on new empirical territory.

The analysis and the survey design apply several measures to reduce common source bias (Andersen, Heinesen and Pedersen 2016). First, the survey questionnaire avoids the use of self-evaluation measurements as well as complicated or ambiguous items. This entails careful wording of concrete questions and pilot testing (Jakobsen and Jensen 2016). For the dependent variables, the survey asks business respondents to choose whether they gained specific types of named benefits (or none) from the PPP to induce a more objective assessment rather than asking them to overall evaluate performance. For the independent variables, multiple concrete items measure a concept such as trust rather than asking the respondents to assess trust, which is a complicated concept prone to different interpretations (see **Table 2** later in this section). Secondly, using three

dependent variables of different types of business values in the analysis reveals whether the estimated effect of, for instance, trust is high regardless of value type, which could indicate inflated effects due to response bias. Finally, combining survey findings with interview data from the comparative case study triangulates the results. [4]

Operationalization of variables

Table 2 and the following subsections report the dependent and explanatory variables.

Dependent variables

The three dependent variables of *transferred*, *synergistic* and *interaction and associational value* measure participants' perceptions of business value in PPPs, following practice in recent PPP studies (Klijn et al. 2010b; Klijn et al. 2015). Using the question "*Please assess whether your firm has achieved one or more of the mentioned benefits by participating in the PPP*," the respondents could choose among the following value items: "*Product development," "Reference for use in future sale and collaboration," "Increased revenue," "Increased sale," "More employees," "Test of product," "Positive press coverage," "New knowledge," "Network with public organizations,"* and *"Network with other firms*."[5] The respondents furthermore had the option of answering "*The business has not achieved anything from participating.*" The survey items are added into three corresponding count variables and coded as 0 in cases where the business did not achieved any benefits, 1 in cases where one of the value items were chosen, 2 if two items have been chosen and so forth. The addition of items into three variables is based on factor loadings above 0.8 and reliability analyses with Cronbach's alpha above 0.7 (see Table A1 in the appendix) (Hair et al. 1995).

The descriptive results for the dependent variables show that approximately 65 percent gained one or more *interaction and associational values*, while 82 percent of the respondents gained one or more *synergistic values* respectively from the PPP (cf. **Table 2** at the end of this section). *Transferred value* creation is less common; with 15 percent of the business respondents reporting improvements in increased sales, revenue or more employees, and 12 percent reported two or more of these benefits. Businesses thereby attained more innovation and network-related benefits than economic benefits from the PPPs.

Explanatory variables

Innovation training (H1) is measured as courses and education in innovation, which in Denmark typically revolves around acquiring new skills on how to initiate and manage innovation processes. The respondents were asked *"Have you participated in courses/education about innovation?"* with the following response options: *"Short courses of 9 days or fewer," "Longer courses of 10 days or more," "Diploma, master or other long degree," "Internal training in the organization,"* or *"No, I have not participated in courses or education about innovation."* In line with the arguments presented in the theoretical section, this measure is not an expression of innovativeness but the capabilities needed to facilitate the development of new solutions and thus enhance value creation.

PPP experience (H2) is the number of PPPs the respondents have participated in, based on the question *"How many PPP projects have you participated in altogether?"* The respondents could choose among five categories: *"1," "2-3," "4-5," "6 or more,"* and *"Don't know."* Both variables were originally categorical (based on four and five categories respectively) and are transformed into dichotomous variables. *PPP experience* is coded as 1 in cases where the respondent

participated in four or more PPPs compared to three or fewer coded as 0. The coding is based on the median value of 2-3 PPPs. *Innovation training* is coded as 1 if the respondents participated in innovation courses, degrees or internal organizational training compared to no training, coded as 0. Three variables distinguishing between shorter courses, internal training and longer degrees in innovation are reported in the analysis to explore differences in types of training. These variables are not included in the final model due to the small number of observations (see instead Table A4 in appendix).

Trust (H3) is an index from 1 to 5 with high values representing high levels of trust. The index is constructed from the respondents' level of agreement with four statements: *"The other organizations act only according to their own and not the common interests of the partnership,"" Your organization can expect that the other parties will do what has been agreed in the PPP," "The other organizations in the PPP have the necessary professional/technical skills,"* and *"There is frequent interaction (dialogue, meetings, presence) among the public and private organizations in the PPP."* The response categories use a five-point Likert scale from strongly agree to strongly disagree with a neutral middle category. The items represent the four dimensions of trust from the theoretical section (see **Table 2**). For instance, ability is the perception of the other partners' competencies and whether they can be trusted to take care of a certain task (Mayer et al. 1995). The survey measures this dimension as technical/professional skills, because the tasks related to an innovation-oriented PPP often revolves around developing new technology within a particular service area. The items are summed and divided by number of items to create the index based on factor loadings above 0.6 and 0.7 and a Cronbach's alpha of 0.633 (see Table A2 in appendix).

PPP size (H4) is transformed into a dichotomous variable to facilitate interpretation and because original variable was right-skewed, with respondents in PPPs of six or more organizations coded as 1 compared to five or fewer coded as 0.

Finally, the variable *Organization size*, measured as the number of employees, aims to control for the businesses' capacity to commit to and benefit from a partnership. The respondents were asked *"How many employees does the organization have in total?"* with the following response options: "*Fewer than 10," "10-49," "50-249," "250-499," "500-999" and "1000 or more."* Only *Organization size* is included in the final model and summary of variables due to the small number of observations. However, two dummy variables, *PPP hospitals* and *PPP eldercare*, control for differences in PPP characteristics and value creation between the two main policy sectors. Likewise, the dummy variable *Contracts* control for differences in value creation in PPPs with and without written contracts. Except for a somewhat enhanced effect of PPP size on transferred value, the direction and size of the estimated effects of the four explanatory variables remain more or less the same when these additional control variables are included, thus indicating a relatively robust model (see model including all control variables in Table A5 in appendix).

Survey data analysis

The analysis uses Poisson regression to predict the three types of business values in three corresponding models due to the count dependent variables.[6] All three models are filtered by a dummy variable distinguishing public from private sector organizations to include only business respondents. The independent variables show no signs of multicollinearity with a mean variance inflation factor of 1.03. The pairwise bivariate correlations are included in Table A3 in the appendix for descriptive purpose, which supports the results of the regression analysis. [7]

Comparative case study

The qualitative part of the study is a comparative analysis of eight innovation-oriented PPPs that nuances and supports the survey results. The eight case studies represent PPPs with different innovation goals that often revolve around developing new technology to improve workflow and user experience in healthcare or eldercare. The partnerships entail participation from at least one business, ranging from small startups to established companies, and one public partner, such as a hospital ward or nursing home. **Table 3** provides an overview of the eight cases.

The cases represent a diverse group that includes outcome variation concerning whether or not the PPP achieved innovation (as the main goal in this type of PPP) and benefits for the public and private sectors (Seawright and Gerring 2008). The assessment of innovation and value outcomes is based on information from public sources and/or project participants demonstrating that new solutions were developed and put to use in a public organization (Moore and Hartley 2008) and if the partners, for instance, gained financial benefits from the PPP.

The case studies used semi-structured interviews with a representative from the participating business, in cases where only one private organization took part, or the most involved businesses, in cases with multiple private partners. In total, 10 business representatives were interviewed, including technical project leaders and CEOs (see **Table 3**). An interview guide covered key theoretical themes and expectations, while allowing for new insights and follow-up questions (Kvale 2007). The interviews lasted about an hour each, focusing on what the interviewees perceived as key drivers and barriers at the participant, collaborative process and structural level as well as any gained benefits. The interviewees represent businesses of varying size, age and scope. Similar to the survey respondents, they were chosen because they constitute the most involved

individuals from the participating businesses, who stand to gain and loose the most, while also knowing more about the dynamics of the partnerships.

Interview data analysis

The coding of interview material identified the presence of the four hypothesized factors (innovation training, PPP experience, trust and PPP size) and gained business value in each case.[8] Valence codes assigned direction to the coded factors depending on whether the interviewed businesses perceived them as a driver or a challenge. The analysis furthermore categorized the eight cases into two outcome groups of either high or low business value based on whether the businesses achieved all types of value or only a few/none. Secondly, a comparative analysis using matrix queries displayed which factors are coded as drivers or barriers in each case and across cases, contrasting the results with the two case groups of high and low business value (Bazelay and Jackson 2013). The purpose was to identify patterns of association between the hypothesized factors and degree of value achieved, and to explore these patterns for more detailed explanations. The case analysis thereby provides examples and more in-depth knowledge on how innovation training, PPP experience, trust, and PPP size affect value creation to supplement the survey results.

Results: Business Value in PPPs

The next sections present key findings from the Poisson regression and comparative case analysis. The results are subsequently discussed in the conclusion in light of the theoretical framework.

Survey results

Table 4 shows the results of the regression models and which factors have significant effects on different business values. Overall, the survey results provide evidence for hypotheses H2 on PPP experience, H3 regarding trust and H4 on PPP size, although these three independent variables only have a significant and positive effect on some types of business values. These results are reviewed in more detail below **Table 4**. Hypothesis H1, regarding innovation training, is not supported for any of the business values. However, including three dummy variables that distinguish between different types of innovation training show that participants with longer degrees in innovation increases the number of synergistic values compared to participants with no training or only shorter courses. This model is only included in the appendix (see Table A4), but it suggests that the role of innovation training matters and calls for further exploration.

The second column in **Table 4** reports the effect of the independent variables as the change in number of transferred benefits. The coefficient for PPP experience in the second row indicates that business participants with experience in four or more PPPs increases the number of economic benefits by 0.5 compared to respondents with experience in three or fewer PPPs, holding constant the effects of other variables. In the fourth row, the coefficient for PPP size indicates that the number of economic benefits decreases by 0.4 for respondents who have participated in a PPP with six or more organizations compared to five or fewer organizations, holding constant the effects of other variables. As anticipated, these results suggests that businesses with PPP experience have acquired the competencies to develop and profit from new solutions in a partnership context, while a PPP with many partners imply higher complexity and a wider distribution of benefits.

The fourth column in **Table 4** reports the effect of the independent variables as the change in number of synergistic benefits. Here, the coefficient for PPP experience in the second row indicates that participation of individuals with experience from four or more PPPs compared to three

or fewer decreases the number of synergistic benefits by 0.6, holding constant the effect of other variables. In contrast to the positive effect of PPP experience on transferred value, this result is unexpected. A possible interpretation is that businesses with experience from multiple PPPs have already attained such benefits as new knowledge, thereby reducing synergistic value creation from participating in additional partnerships. Meanwhile, the coefficient for trust in the third row indicates that an increase in the level of trust increases the number of synergistic benefits by 0.4, holding constant the effects of other variables. This result implies that trust is important in successfully developing innovative products in collaboration with public partners.

The final column in **Table 4** reports the effect of the independent variables as the change in number of interaction and associational benefits. The coefficient for PPP experience in the second row indicates that respondents with experience from four or more PPPs compared to three or fewer decreases the number of interaction and associational benefits by 0.5, holding constant the effects of other variables. The coefficient for trust in the third row indicates that an increase in the level of trust between the partners increases the number of interaction and associational values by 0.7 benefits, holding constant the effects of other variables. Similar to the effect on synergistic value, the results suggests that businesses with experience from four or more PPPs have already gained network development and references from previous partnerships, which reduces the number of interaction and associational benefits from more PPPs. Moreover, trust is an important condition for establishing networks with other organizations as expected.

Figures 1 and **2**, respectively, report graphically the discrete and continuous variable results. **Figure 1** shows that transferred benefits *increase* from close to zero to nearly one when the business participants' PPP experience change from three or fewer to four or more partnerships. Meanwhile, the same change in PPP experience leads to a *reduction* to nearly one synergistic

benefit from an observed value of close to two synergistic benefits. **Figure 2** shows how a change from the lowest to the highest level of trust increases synergistic as well as interaction and associational values from around zero to two benefits, while the effect of trust on transferred value is minuscule and not significant. Finally, overlapping confidence intervals for some results also illustrate how the explanatory variables only have a significant effect on some types of value - or at certain levels in the case of trust - as well as the relative uncertainty surrounding the estimates. In the next section, the comparative case studies are used to support the survey results.

Case study results

Table 5 provides an overview of the drivers and barriers that were influential in creating value in the case studies.

First, **Table 5** illustrates how task-relevant competencies, as theorized, are perceived as important drivers in case studies that achieved high levels of business value, while a lack of task-relevant competencies constitute a barrier in cases that achieved both high and low levels of business value. However, and similar to the survey results, innovation training and PPP experience do not constitute the most relevant types of competencies as posited in hypotheses 1 and 2. Rather, operational capabilities are important drivers (Bryson et al. 2015:655; Winter 2003). In case number six, where an e-medicine solution for wound care was developed and implemented, the interviewed business representative explained how the involved healthcare practitioners had a profound knowledge and expertise in the field of wound care. They knew exactly what was needed and relevant for the e-medicine solution to be of use, which facilitated the business's technical development (interview with business representative in case 6, February 2014). The result was a simple and popular solution that created a positive reputation and sales for the business. This example

demonstrates that value creation in an innovation-oriented PPP requires a diverse set of skills and capabilities depending on the specific policy sector and type of technical development (Winter 2003; Lepak et al. 2007).

Secondly, **Table 5** shows how trust is perceived as a key driver in cases with both high and low levels of business value creation. This finding supports, in part, hypothesis 3 and the survey results, where trust is found to have a positive effect on some types of business value, but also indicates that the influence of trust depends on the role of other factors. For instance, new ways of treating chronic obstructive lung disease (COLD) was never fully realized in case 7, which did not produce benefits for the interviewed business. The large number of participating businesses made it difficult to ensure their commitment and develop trust between the partners (interview with PPP project leader from the private sector in case 7, August 2014). The analysis thereby supports the hypothesized effect of PPPs with many partners on value creation (Ysa et al. 2014; Murphy et al. 2015). However, it also exemplifies that one factor, such as the size of the PPP, can enhance or inhibit the influence of other factors, in this case trust and commitment. Interview subjects in case 3 perceived the partnership as based on mutual trust stemming from open dialogue and a belief that they were acting out of common interests. Meanwhile, incongruent expectations and technical difficulties prevented successful completion of the PPP in terms of implementing and selling the developed solution (interview with business in case 3, January 2014). The business did not report any economic benefits, but the network and product development from the PPP have since become valuable in other projects. Similar to the survey results, trust was not enough to ensure creation of economic benefits due to the inhibiting role of other factors, but has facilitated synergistic and network-related benefits.

Finally, the case studies also show that there are other cross-case drivers and barriers than those hypothesized, which influence value creation. This finding further demonstrates the complex interplay between factors. For instance, limited time and resources have constituted recurrent challenges across cases, but whether these reduced the benefits gained by the businesses depends on the role of other factors. Two interviewees thus explain how support from top-level management and involved staff was crucial in encouraging the completion of the project despite a lack of financial resources (interview with two business representatives in case 1, August 2014).

Discussion and Conclusion

The research presented here shows that businesses gain more innovative and network-related benefits than economic benefits from PPPs. Moreover, PPP experience, mutual trust and fewer partners increase certain types of business values. Thereby, this mixed methods study supports three out of the four tested hypotheses, whereas the results regarding the final hypothesis on innovation training are more ambiguous.

Specifically, the quantitative analysis demonstrates that trust increases the number of synergistic as well as interaction and associational benefits. PPPs with six or more organizations decrease the number of transferred benefits compared to PPPs with five or fewer partners, and experience with four or more PPPs increases the number of transferred benefits but reduces synergistic and interaction and associational benefits. The case studies shed light on these diverging effects by revealing a more configurative interplay between the examined factors. As such, mutual trust between the public and private partners is not on its own enough to increase business value in PPPs, but depends on the performance of other factors. The comparative analysis further shows

that task-relevant competencies go beyond the hypothesized innovation training to include participants with the necessary technical skills and knowhow. A supplementary regression analysis likewise suggests that there is a potential for further exploring the effect of different types of innovation training on business value. These findings suggest that operational capabilities among both public and private participants related to their professional expertise and core technical knowledge are required (Winter 2003; Lepak et al. 2007; Crosby et al. 2016).

The results illustrate the need for configurational theories and models of network outcomes (Bryson et al. 2015; Ansell and Gash 2008; Wang 2016; Provan and Kenis 2008). The diverging effect of trust, PPP size and PPP experience on different types of business values calls for more precision in theorizing how PPPs contribute to value creation (Austin and Seitanidi 2012a). For instance, trust increases the probability of successful outcomes in PPPs (e.g., Klijn et al. 2010a), but it is not a sufficient condition on its own and it only increases certain types of business value (Cabral and Krane 2016; Rufin and Rivera-Santos 2012).

The negative effect of more experience with PPPs on synergistic as well as interaction and associational value is somewhat surprising. This result suggests that businesses who have previously participated in multiple PPPs have already increased their organization's network and learning potential. The positive effect of more experience on transferred value, on the other hand, indicates that businesses with PPP experience are more likely to gain economic benefits owing to an improved capacity to gain a competitive advantage through PPPs (Teece et al. 1997). PPP experience thus positively affects value creation, but it does not necessarily have a positive effect on all types of values (Murphy et al. 2015).

Finally, these findings offer insights for public and private practitioners working with innovation-oriented PPPs in healthcare and eldercare. The study demonstrates that product development and new knowledge are potential benefits to emphasize when incentivizing businesses to collaborate. Public partners can provide professional knowledge and a setting for testing new solutions to enhance these types of benefits. Meanwhile, businesses can benefit from ensuring participants with PPP experience and relevant technical skills and prioritize trust building with the public partners to develop their network and knowledge base.

About the Author

Lena Brogaard (brogaard@ruc.dk) is an assistant professor and postdoc at the Department of Social Sciences and Business at Roskilde University, Denmark. Lena received her PhD in public administration from Roskilde University. Her current research focuses on innovation, value creation and outcome antecedents in public-private partnerships, mainly within healthcare and social services. Other research topics include free choice and the effects of contracting out.

Notes

[1]Austin and Seitanidi's evaluation framework distinguish between interaction and associational benefits as two separate categories (Austin and Seitanidi 2012b). They are operationalized into one category in this study, as they concern intangible benefits rather than revenue and innovation. High factor loadings and reliability scores support the validity and internal consistency of this categorization of survey items (see Table A1 in the appendix). The value categories may be mutually reinforcing. For instance, socially responsible activities can influence a business' financial performance through improved stakeholder relationships (Barnett and Solomon 2012; Austin and Seitanidi 2012b).

[2]As a part of a larger research project, the survey was distributed to both public and private respondents (497 in total), but only business responses are used in this study.

[3]The majority of the business respondents are small to midsized businesses (SMBs of 249 employees or less). To the knowledge and experience of the author, SMBs rather than large businesses usually participate in innovation-oriented PPPs, which indicates some degree of survey representativeness. SMBs view this type of partnership as an opportunity to develop new products and gain access to funding and the public sector.

[4]The results of the regression analyses do not show obvious signs of biased relationships in terms of highly inflated or deflated effects (Andersen et al. 2016). The only variable showing consistently significant effects on all three dependent variables is the registered number of PPPs the respondents have participated in, which is not likely to be affected by response bias. Moreover, the dependent variables do not indicate that the respondents overstate their reported benefits, e.g., the average transferred value is .465 on a scale from 0-3 (see **Table 2**).

[5]The business respondents could choose among 13 benefits achieved by their organization in the PPI, but the item "other" was too vague to be included here, and the items "export opportunities" and "new company" are left out as they represent long-term business sustainability.

[6]A negative binomial regression model was tested against the Poisson model with a likelihood-ratio (LR) test, showing only barely significant evidence of overdispersion ($p<.05$) (over predicting zero) for transferred value. As the size and direction of the estimates in the two models are very close, Poisson regression is used to predict all three variables, using robust standard errors. All regression analyses were performed in Stata 14.

[7]It is considered somewhat risky to use maximum likelihood with samples smaller than 100 and the results should be interpreted with caution (Long and Freese 2014). The risk of uncertain estimates has been addressed by limiting the number of variables and checking the robustness of the results with OLS regression and by running the model with the original scaled variable for PPP size, which yielded similar results. Finally, the robustness was tested with additional control variables, which did not alter the results (see Table A5).

[8]All raw interview material was organized and thematically coded in NVivo 11.

Acknowledgements

Thank you to the editor and two anonymous reviewers for providing thorough and useful suggestions. Also, a special thanks to Ole Helby Petersen, Yosef Bhatti and John Bryson for advice and input on earlier versions of this article.

References

Agle, B. R. and C. B. Caldwell. 1999. "Understanding Research on Values in Business: A Level of Analysis Framework." *Business & Society* 38(3):326–87. doi:10.1177/000765039903800305.

Alexander, R. 2012. "Network Structures and the Performance of Brownfield Redevelopment PPPs." *Public Performance & Management Review* 35(4):753–68. doi:10.2753/pmr1530-9576350409.

Amit, R. and C. Zott. 2001. "Value Creation in E-Business." *Strategic Management Journal* 22(6/7):493–520. doi:10.1002/smj.187.

Andersen, L. B., E. Heinesen, and L. H. Pedersen. 2016. "Individual Performance: From Common Source Bias to Institutionalized Assessment." *Journal of Public Administration Research and Theory* 26(1):63–78. doi:10.1093/jopart/muv010.

Andrews, R. and T. Entwistle. 2010. "Does Cross-Sectoral Partnership Deliver? An Empirical Exploration of Public Service Effectiveness, Efficiency, and Equity." *Journal of Public Administration Research and Theory* 20(3):679–701. doi:10.1093/jopart/mup045.

Ansell, C. and A. Gash. 2008. "Collaborative Governance in Theory and Practice." *Journal of Public Administration Research and Theory* 18(4):543–71. doi:10.1093/jopart/mum032.

Austin, J. E. and M. M. Seitanidi. 2012a. "Collaborative Value Creation: A Review of Partnering between Nonprofits and Businesses: Part I. Value Creation Spectrum and Collaboration Stages." *Nonprofit and Voluntary Sector Quarterly* 41(5):726–58. doi:10.1177/0899764012450777.

Austin, J. E. and M. M. Seitanidi. 2012b. "Collaborative Value Creation: A Review of Partnering between Nonprofits and Businesses. Part 2: Partnership Processes and Outcomes." *Nonprofit and Voluntary Sector Quarterly* 41(6):929–68. doi:10.1177/0899764012454685.

Barnett, M. L. and Solomon, R. M. 2012. "Does It Pay to be Really Good? Addressing the Shape of the Relationship between Social and Financial Performance." *Strategic Management Journal* 33:1304–20. doi:10.1002/smj.1980.

Bazelay, P. and K. Jackson. 2013. *Qualitative Data Analysis with Nvivo*. 2nd ed. London: Sage.

Bland, T., B. Bruk, D. Kim, and K. T. Lee. 2010. "Enhancing Public Sector Innovation: Examining the Network-Innovation Relationship." *The Innovation Journal: The Public Sector Innovation Journal* 15(3):1–17.

Boyer, E. J., D. M. Van Slyke, and J. D. Rogers. 2016. "An Empirical Examination of Public Involvement in Public-Private Partnerships: Qualifying the Benefits of Public Involvement in PPPs." *Journal of Public Administration Research and Theory* 26(1):45–61. doi:10.1093/jopart/muv008.

Brinkerhoff, D. W. and J. M. Brinkerhoff. 2011. "Public-Private Partnerships: Perspectives on Purposes, Publicness, and Good Governance." *Public Administration and Development* 31(1):2–14. doi:10.1002/pad.584.

Bryson, J. M., F. Ackermann, and C. Eden. 2016. "Discovering Collaborative Advantage: The Contributions of Goal Categories and Visual Strategy Mapping." *Public Administration Review* 76(6):912–25 (e-pub ahead of print). doi:10.1111/puar.12608.

Bryson, J. M., B. C. Crosby, and M. M. Stone. 2015. "Designing and Implementing Cross-Sector Collaborations: Needed and Challenging." *Public Administration Review* 75(5):647–63. doi:10.1111/puar.12432.

Cabral, S. and D. Krane. 2016. "Civic Festivals and Collaborative Governance." *International Review of Administrative Science* (e-pub ahead of print). doi:10.1177/0020852315615196.

Cabral, S., S.G. Lazzarini, and P. F. de Azevedo. 2013. "Private Entrepreneurs in Public Services: A Longitudinal Examination of Outsourcing and Statization of Prisons." *Strategic Entrepreneurship Journal* 7:6–25. doi:10.1002/sej.1149.

Carpintero, S. and O. H. Petersen. 2014. "PPP Projects in Transport: Evidence from Light Rail Projects in Spain." *Public Money & Management* 34(1):43–50. doi:10.1080/09540962.2014.865935.

Chen, C., M. Hubbard, and C. Liao. 2013. "When Public–Private Partnerships Fail." *Public Management Review* 15(6):839–57. doi:10.1080/14719037.2012.698856.

Crosby, B. C., P. 't Hart, and J. Torfing. 2016. "Public Value Creation through Collaborative Innovation." *Public Management Review* 19(5):1–15. doi:10.1080/14719037.2016.1192165.

Danish Enterprise and Construction Authority. 2009. *Analysis of Public-Private Collaboration on Innovation (Title Translated from Danish)*. Copenhagen: Danish Enterprise and Construction Authority.

Edelenbos, J. and E. Klijn. 2007. "Trust in Complex Decision-Making Networks—A Theoretical and Empirical Exploration." *Administration & Society* 39(1):25–50. doi:10.1177/0095399706294460.

Edelenbos, J. and E. Klijn. 2009. "Project Versus Process Management in Public-Private Partnership: Relation between Management Style and Outcomes." *International Public Management Journal* 12(3):310–31. doi:10.1080/10967490903094350.

Edelenbos, J., E. Klijn, and B. Steijn. 2007. "The Role of Trust in Public Private Partnerships: Does Trust Matter?" *Politik* 10(3):63–71.

Emerson, K., T. Nabatchi, and S. Balogh. 2012. "An Integrative Framework for Collaborative Governance." *Journal of Public Administration Research and Theory* 22(1):1–29. doi:10.1093/jopart/mur011.

Girth, A. M. 2014. "What Drives the Partnership Decision? Examining Structural Factors Influencing Public-Private Partnerships for Municipal Wireless Broadband." *International Public Management Journal* 17(3):344–64. doi:10.1080/10967494.2014.935240.

Hair, J. F., R. E. Anderson, R. L. Tatham, and W. C. Black. 1995. *Multivariate Data Analysis*. 4th ed. New Jersey: Prentice Hall.

Hoang, H. and B. Antoncic. 2003. "Network-Based Research in Entrepreneurship: A Critical Review." *Journal of Business Venturing* 18(2):165–87. doi:10.1016/s0883-9026(02)00081-2.

Hodge, G. and C. Greve. 2013. *"Public-Private Partnership in Turbulent Times." Pp. 1–32 in Rethinking Public-Private Partnerships: Strategies for Turbulent Times, edited by Carsten Greve and Graeme Hodge.* Oxon: Routledge.

Holgado–Tello, F. P., S. Chacón–Moscoso, I. Barbero–García, and E. Vila–Abad. 2010. "Polychoric Versus Pearson Correlations in Exploratory and Confirmatory Factor Analysis of Ordinal Variables." *Quality & Quantity* 44(1):153–66. doi:10.1007/s11135-008-9190-y.

Jakobsen, M. and R. Jensen. 2015. "Common Method Bias in Public Management Studies". *International Public Management Journal* 18(1):3–30. doi:10.1080/10967494.2014.997906.

Kaine, S. and J. Green. 2013. "Outing the Silent Partner: Espousing the Economic Values that Operate in Not-for-Profit Organizations." *Journal of Business Ethics* 118(1):215–25. doi:10.1007/s10551-012-1583-0.

Kivleniece, I. and B. V. Quelin. 2012. "Creating and Capturing Value in Public-Private Ties: A Private Actor's Perspective." *Academy of Management Review* 32(2):272–99. doi:10.5465/amr.2011.0004.

Klijn, E., J. Edelenbos, and B. Steijn. 2010a. "Trust in Governance Networks its Impacts on Outcomes." *Administration & Society* 42(2):193–221. doi:10.1177/0095399710362716.

Klijn, E., B. Steijn, and J. Edelenbos. 2010b. "The Impact of Network Management on Outcomes in Governance Networks." *Public Administration* 88(4):1063–82. doi:10.1111/j.1467-9299.2010.01826.x.

Klijn, E. and G. R. Teisman. 2003. "Institutional and Strategic Barriers to Public-Private Partnership: An Analysis of Dutch Cases." *Public Money & Management* 23(3):137–46. doi:10.1111/1467-9302.00361.

Klijn, E., T. Ysa, V. Sierra, E. Berman, J. Edelenbos, and D. Y. Chen. 2015. "The Influence of Network Management and Complexity on Network Performance in Taiwan, Spain and the Netherlands." *Public Management Review* 17(5):736–64. doi:10.1080/14719037.2014.957340.

Kvale, S. 2007. *Doing Interviews*. The Sage Qualitative Research Kit. Thousand Oaks, CA: Sage Publications.

Leech, N. L. and A. J. Onwuegbuzie. 2007. "A Typology of Mixed Methods Research Designs." *Quality & Quantity* 43(2):265–75. doi:10.1007/s11135-007-9105-3.

Lepak, D. P., K. G. Smith, and M. S. Taylor. 2007. "Value Creation and Value Capture: A Multilevel Perspective." *Academy of Management Review* 32(1):180–94. doi:10.5465/amr.2007.23464011.

Long, J. S. and J. Freese. 2014. *Regression Models for Categorical Dependent Variables using Stata*. 3rd ed. College Station, TX: Stata Press.

Mahoney, J. T., A. M. McGahan, and C. N. Pitelis. 2009. "The Interdependence of Private and Public Interests." *Organization Science* 20(6):1034–52.

Mayer, R. C., J. H. Davis, and F. D. Schoorman. 1995. "An Integrative Model of Organizational Trust." *Academy of Management Review* 20(3):709–34. doi:10.5465/amr.1995.9508080335.

Moore, M. and J. Hartley. 2008. "Innovations in Governance." *Public Management Review* 10(1):3–20. doi:10.1080/14719030701763161.

Murphy, M., D. Arenas, and J. M. Batista. 2015. "Value Creation in Cross-Sector Collaborations: The Roles of Experience and Alignment." *Journal of Business Ethics* 130(1):145–62. doi:10.1007/s10551-014-2204-x.

Olesen, K. N. 2013. "Model Contracts for Public-Private Innovation Partnerships, a Danish Initiative." *European Procurement & Public Private Partnership Law Review* 8(3):248–56. doi:10.21552/epppl/2013/3/176.

Page, S. B., M. M. Stone, J. M. Bryson, and B. C. Crosby. 2015. "Public Value Creation by Cross-Sector Collaborations: A Framework and Challenges of Assessment." *Public Administration* 93(3):715–32. doi:10.1111/padm.12161.

Provan, K. G. and P. Kenis. 2008. "Modes of Network Governance: Structure, Management, and Effectiveness." *Journal of Public Administration Research and Theory* 18(2):229–52. doi:10.1093/jopart/mum015.

Reynaers, A. 2014. "Public Values in Public-Private Partnerships." *Public Administration Review* 74(1):41–50.

Rufín, C. and M. Rivera-Santos. 2002. "Between Commonweal and Competition: Understanding the Governance of Public–Private Partnerships." *Journal of Management* 38(5):1634–54. doi:10.1177/0149206310373948.

Santos, J. and A. Reynaldo. 1999. "Cronbach's Alpha: A Tool for Assessing the Reliability of Scales." *Journal of Extension* 37(2):1–5.

Seawright, J. and J. Gerring. 2008. "Case Selection Techniques in Case Study Research: A Menu of Qualitative and Quantitative Options." *Political Research Quarterly* 61(2):294–308. doi:10.1177/1065912907313077.

Steijn, B., E. Klijn, and J. Edelenbos. 2011. "Public Private Partnerships: Added Value by Organizational Form or Management?" *Public Administration* 89(4):1235–52. doi:10.1111/j.1467-9299.2010.01877.x.

Teece, D. J. 1992. "Competition, Cooperation, and Innovation: Organizational Arrangements for Regimes of Rapid Technological Progress." *Journal of Economic Behavior & Organization* 18(1):1–25. doi:10.1016/0167-2681(92)90050-l.

Teece, D., G. Pisano, and A. Shuen. 1997. "Dynamic Capabilities and Strategic Management." *Strategic Management Journal* 18(7):509–33. doi:10.1002/(sici)1097-0266(199708)18:7<509::aid-smj882>3.0.co;2-z.

Van Der Wal, Z., G. De Graaf, and K. Lasthuizen. 2008. "What's Valued Most? Similarities and Differences between the Organizational Values of the Public and Private Sector." *Public Administration* 86(2):465–82. doi:10.1111/j.1467-9299.2008.00719.x.

Vangen, S. and C. Huxham. 2012. "The Tangled Web: Unraveling the Principle of Common Goals in Collaborations." *Journal of Public Administration Research and Theory* 22(4):731–60. doi:10.1093/jopart/mur065.

Wang, W. 2016. "Exploring the Determinants of Network Effectiveness: The Case of Neighborhood Governance Networks in Beijing." *Journal of Public Administration Research and Theory* 26(2):375–88. doi:10.1093/jopart/muv017.

Weihe, G. 2008. "Public-Private Partnerships and Public-Private Value Trade-Offs." *Public Money & Management* 28(3):153–58. doi:10.1111/j.1467-9302.2008.00637.x.

Winter, S. G. 2003. "Understanding Dynamic Capabilities". *Strategic Management Journal* 24:991–95. doi:10.1002/smj.318.

Ysa, T., V. Sierra, and M. Esteve. 2014. "Determinant of Network Outcomes: The Impact of Management Strategies." *Public Administration* 92(3):636–55. doi:10.1111/padm.12076.

Table 1. Overview of responses.

	Business respondents	
Survey sample in total	246	100%
Completed responses (I)	89	36.2%
Partial responses (P)	35	14.2%
Refusal and breakoff (R)	8	6.5%
Noncontact (NC)	114	46.3%
Response rate (I+P)/(I+P+R+NC)	**124**	**50.4%**

Note: Based on AAPOR's response rates type 1 (The American Association for Public Opinion Research 2008).

Note: For 11 PPIs it was only possible to identify a private respondent and for 14 PPIs only a public representative was identified, which means that a business respondent was invited to participate in 246 partnerships.

Table 2 Overview of variables used in the quantitative analysis.

Variable	Survey items	Coding	Obs.	Mean	Min	Max
Dependent variables						
Transferred value	- More employees - Increased revenue - Increased sale	0=no items chosen (72.7%) 1=one item (15.2%) 2=two items (5%) 3=all items (7%)	99	.465	0	3
Synergistic value	- Test of product - New knowledge/experi-ences - Product development	0=no items chosen (18.2%) 1=one item (21.2%) 2=two items (38.4%)	99	1.646	0	3

		3=all items (22.2%)				
Associational and interaction value	- The firm has received positive press coverage - Reference for use in the firm's future sales and collaboration - Network with public organizations - Network with other firms	0=no items chosen (35.4%) 1=one item (24.3%) 2=two items (27.3%) 3=three items (7.1%) 4=all items (6.1%)	99	1.242	0	4
Explanatory variables						
Innovation training	"Have you participated in courses/education about innovation?" - Short courses of 9 days or fewer	0=no innovation education or courses	90	.656	0	1

	- Longer courses of 10 days or more - Diploma, master or other long degree - Internal training in the organization - No, I have not participated in courses or education about innovation	1=innovation education or courses				
PPP experience	"How many PPP projects have you participated in altogether?" 1/2-3/4-5/6 or more/Don't know	0=1-3 PPPs 1=4-6 PPPs or more	87	.218	0	1
Trust*	- The other organizations act only according to their own and not the common interests of the partnership. - Your organization can expect that the other	Index from 1 to 5, where 5 is highest level of trust	78	3.920	1.75	5

	parties will do what has been agreed in the PPP. - The other organizations in the PPP have the necessary profes-sional/technical skills. - There is frequent interac-tion (dialogue, meet-ings, presence) among the public and private organizations in the PPP.					
PPP size	Pre-identified number of participating organizations for each partnership the survey was distributed to and which each respondent is affiliated with.	0=5 or fewer 1=6 or more organizations	124	.355	0	1
Control variable						

Organization size	"How many employees does the organization have in total?" Fewer than 10/10-49/50-249/250-499/500-999/1000 or more/don't know	0=249 employees or fewer 1=250 employees or more	124	.137	0	1

Note: For some variables, the total number of observations is less than the number of completed private sector responses (89) because "don't know" has been excluded. Using listwise deletion, this leads to a final sample size of 76 in the regression analyses.

Note: The survey was in Danish but the items used here have been translated into English by the author.

*Respondents were asked to assess the four items on a five-point Likert scale ranging from "strongly disagree" to "strongly agree". The scale for the first item was reversed to match the other items before constructing the index.

Table 3. Overview of case studies used in the qualitative analysis.

No.	Case title	Case purpose (innovation)	Sector	Business interviews
1	Communication platforms	Develop electronic platform to reduce administration and improve work flow	Eldercare	2
2	Medicine administration	Develop solution to reduce errors in management of medicine and to empower citizens	Eldercare	1
3	The preventive shirt	Develop technology that makes rehabilitation more flexible	Eldercare	1

4	Electronic lock units	Test electronic locks to improve workflow and reduce time and costs spent on locks in homecare	Eldercare	(1)
5	Sensory delivery rooms	Develop and test if sound, images, and light can improve the experience for women in labor	Healthcare	2
6	E-medicine	Develop a web-based platform to reduce hospital costs and improve patients' quality of life	Healthcare	1

7	COLD (Chronic Obstructive Lung Disease)	Develop solutions to improve treatment of COLD	Healthcare	2
8	Intelligent stocking	Reduce hospitalization and increase patient safety for heart patients	Healthcare	1

Note: Overall, 28 public and private sector representatives were interviewed from January to November 2014.

Note: In case 4, the company representative who had been involved was no longer with the company, so the interview with the public partner with whom they had the most interaction is used along with an official evaluation report from the project.

Table 4. Poisson regression with three types of value as dependent variables.

	Transferred value		Synergistic value		Interaction and associational value	
	Poisson	AME	Poisson	AME	Poisson	AME
H1: Innovation training (education and courses)	0.144	0.0679	0.125	0.210	0.341	0.421*
	(0.456)	(0.209)	(0.152)	(0.248)	(0.218)	(0.248)
H2: PPP experience (four or more PPPs)	0.931**	0.540**	-0.381**	-0.592**	-0.452*	-0.527**
	(0.394)	(0.256)	(0.175)	(0.242)	(0.255)	(0.262)
H3: Trust	0.153	0.0747	0.218**	0.376**	0.507***	0.667***
	(0.240)	(0.118)	(0.100)	(0.164)	(0.135)	(0.176)
H4: PPP size (six or more organizations)	-0.963*	-0.380**	-0.117	-0.198	0.169	0.229
	(0.494)	(0.166)	(0.139)	(0.233)	(0.199)	(0.274)
Organization size (250 employees or more)	-0.0728	-0.0344	-0.171	-0.277	-0.316	-0.371
	(0.647)	(0.298)	(0.228)	(0.344)	(0.232)	(0.249)
N	76	76	76	76	76	76
Pseudo R^2	0.104		0.030		0.075	

Model p-value	0.0366	0.0366	0.0564	0.0564	0.0004	0.0004

Robust standard errors in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

Note: All analyses have been filtered by the variable Private_organization to include only business respondents.

Note: Average marginal effects (AMEs) reported in the second column.

Table 5. Key barriers and drivers across cases.

Value	Cases	Cross-case drivers	Cross-case barriers
High business value*	Case 1: Communication platforms	Task-relevant skills	Diverging organizational culture and goals
	Case 2: Medicine administration	Exchange of knowledge	Time and resources
	Case 5: Sensory delivery rooms	Contract	Partner commitment
	Case 6: E-medicine	Partner commitment	Lack of task-relevant skills
Low business value**	Case 3: The preventive shirt	Organizational support	Project management
	Case 4: Electronic lock units	Trust	Lack of support
	Case 7: COLD (Chronic Obstructive Lung Disease)		Large partnership
	Case 8: Intelligent stocking		Time and resources
			Lack of commitment
			Lack of task-relevant skills

* Multiple benefits and all types of value; ** Few benefits and value type

Figure 1. Predicted number of benefits by training, PPP experience, and PPP size.

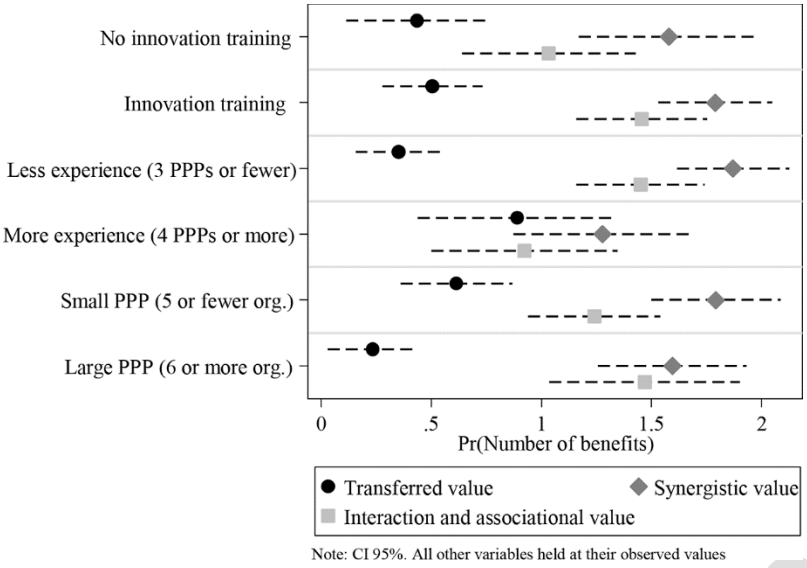
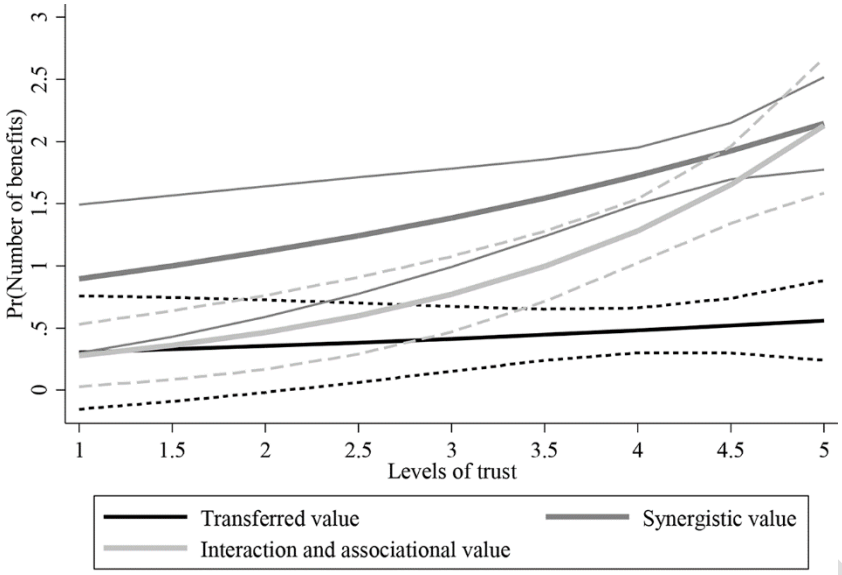


Figure 2. Predicted number of benefits by trust.



Note: CI 95%. All other variables held at their observed values

APPENDIX

Table A1 Factor (pattern matrix) and reliability analysis for dependent variables

Variable	Items	Factor 1 (factor loadings)	Cronbach's alpha
Transferred value	Increased revenue	0.9419	0.7823
	Increased sales	0.9381	
	More employees	0.8970	
Synergistic value	Product development	0.9443	0.7932
	Test of product	0.8588	
	New knowledge	0.8686	
Interaction and associational value	Reference	0.8514	0.7291
	Media coverage	0.8048	
	Public network	0.8032	
	Business network	0.8947	

Note: As the items were all categorical variables, the factor analyses were based on polychoric correlations (Holgado–Tello et al. 2010). Cronbach's alpha can be applied as a reliability measure on both dichotomous and scaled variables (Santos and Reynaldo 1999).

Table A2 Factor loadings for trust items

	Factor 1 (factor loadings)	Cronbach's alpha
The other organizations only act according to their own and not the common interests of the partnership.	0.615	0.633
Your organization can expect that the other parties will do what has been agreed in the PPP.	0.756	
The other organizations in the PPP have the necessary professional/technical skills.	0.724	
There is frequent interaction (dialogue, meetings, presence) among the public and private organizations in the PPP.	0.682	

Extraction Method: Principal Component Analysis. Performed in SPSS.

1 component extracted.

Table A3 Bivariate correlations

	Transferred value	Synergistic value	Interasso value	Innovation skills	PPP experience	Trust	PPP size	Orgainzation size
Transferred value	1							

Synergis-tic value	0.307***	1						
Inter-asso value	0.319***	0.407***	1					
Innova-tion skills	0.0500	0.0446	0.0580	1				
PPP expe-rience	0.288***	-0.198*	-0.131	0.0787	1			
Trust	0.126	0.252**	0.361***	-0.0555	0.0515	1		
PPP size	-0.237**	-0.104	-0.0764	0.00109	0.000663	-0.122	1	
Organisa-tion size	-0.0203	0.00737	0.0548	0.00917	-0.103	0.175	-0.00158	1

* $p < .1$, ** $p < .05$, *** $p < .01$

Table A4 Poisson regression with different levels of innovation training

	Transferred value	Synergistic value	Interaction and asso-ciational value

	Poisson	Poisson	Poisson
H1: Innovation training			
Innovation courses	-0.516	-0.0861	0.159
	(0.606)	(0.147)	(0.187)
Innovation degree	0.566	0.451***	0.592*
	(0.487)	(0.144)	(0.314)
Internal organizational training	0.602	0.181	-0.0714
	(0.393)	(0.177)	(0.209)
H2: PPP experience	0.728**	-0.437***	-0.463*
	(0.370)	(0.158)	(0.250)
H3: Trust	0.224	0.254***	0.552***
	(0.235)	(0.0986)	(0.145)
H4: PPP size	-0.682	-0.0703	0.172
	(0.521)	(0.132)	(0.193)
Organization size	-0.338	-0.226	-0.245
	(0.656)	(0.255)	(0.233)
N	76	76	76

Pseudo R^2	0.140	0.048	0.085
Model p-value	0.00637	0.00702	0.00810

Standard errors in parentheses

Note: All analyses have been filtered by the variable Private_organization to include only business respondents

* $p < .1$, ** $p < .05$, *** $p < .01$

Table A5 Poisson regression including all control variables

	Transferred value	Synergistic value	Interaction and associational value
H1: Innovation training	-0.0318	0.0759	0.430*
	(0.441)	(0.149)	(0.232)
H2: PPP experience	0.930**	-0.360**	-0.568**
	(0.420)	(0.176)	(0.285)
H3: Trust	0.194	0.234**	0.532***
	(0.263)	(0.105)	(0.151)
H4: PPP size	-1.369***	-0.178	0.0881
	(0.529)	(0.145)	(0.206)
Organization size	0.142	-0.220	-0.420*

	(0.637)	(0.260)	(0.251)
Contract	1.682	0.225	-0.235
	(1.071)	(0.191)	(0.315)
PPP hospitals	0.0529	0.214	0.0569
	(0.378)	(0.142)	(0.210)
PPP eldercare	-0.189	0.0898	-0.0668
	(0.433)	(0.145)	(0.211)
N	67	67	67
Pseudo R^2	0.175	0.050	0.088
Model P-value	0.0225	0.000691	0.00166

Standard errors in parentheses

Note: All analyses have been filtered by the variable Private_organization to include only business respondents

* $p < .1$, ** $p < .05$, *** $p < .01$