

Public-Private Partnerships for Higher Education Infrastructure:
A Multiple-Case Study of Public-Private Partnership Models

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ABSTRACT

The use of public-private partnerships is a growing trend in the United States. However, these arrangements' job creation abilities have not fully been studied. The nature of these arrangements allows for a wide variety of organizational structures. This thesis analyzes differing public-private partnership models for their job creation efficiency. The characteristics present in these arrangements are discussed. This thesis is a multiple-case study of three distinct public-private partnerships for higher education infrastructure. The three cases presented are Clemson University's International Center for Automotive Research, the University of Washington's South Lake Union Medical Research Complex, and Louisiana State University's Digital Media Center. The findings of this thesis are that public-private partnership models with substantial upfront non-public investment can create jobs more efficiently from the public sector's perspective. The public-private partnership models that create jobs more efficiently have the characteristics of stability, capacity, and collaboration.

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Chapter 1

Introduction

The United States is facing an economic crisis. This crisis is in part fueled by a lack of jobs in the country. Without enough jobs to go around, numerous citizens of this country cannot provide themselves with enough resources to maintain their livelihood. The unemployment rate for December of 2012 was 7.8% (U.S. Bureau of Labor Statistics 2013).

A possible solution to the crisis is the creation of public-private partnerships (PPPs). First and foremost, PPPs are arrangements between the public sector and an outside partner for the purpose of providing services (Bovaird 2004, 200). There is an opportunity for PPPs to do more with less when it comes to service delivery and therefore policy makers are attracted to these arrangements (Grimsey and Lewis 2005, 346). The number of PPPs are increasing throughout the world (Koontz and Thomas 2012, 770; Anderson, Michael and Peirce 2012, 8). These arrangements have been created for industries ranging from transportation to health care (Hodge and Greve 2009, 35-36). An opportunity could exist for PPPs in higher education. However, there is a lack of scholarly literature about these arrangements' job creation potential. This thesis analyzes PPPs for higher education infrastructure and their opportunity for job creation.

This thesis and the accompanying research are important because they provide a framework for analyzing job creation opportunities of public-private partnerships for higher education infrastructure. This research could provide policy makers with a framework for analyzing whether PPPs in general and whether distinct PPP models specifically should be encouraged as a viable policy option for job creation. There has been an adequate amount of

research dedicated to understanding PPPs, but when it comes to these arrangements' job creation opportunities there is a lack of research and corresponding data. This thesis highlights the gap in available data on job creation capabilities of PPPs. This thesis provides a framework for further research in order to bridge the data gap. The use of PPPs is a growing trend in the United States and around the world and therefore research on whether these arrangements can promote job creation is absolutely necessary.

A multiple-case study is used to examine the following research question. Is there a specific public-private partnership model that can create jobs more efficiently than other models? Three public-private partnerships are presented, each representing a distinct PPP model. The three cases focus on PPPs for higher education infrastructure projects. The three PPPs that are analyzed for this thesis are Clemson University's International Center for Automotive Research (CU-ICAR), University of Washington's South Lake Union Medical Research Complex (UW-SLU), and Louisiana State University's Digital Media Center (LSU-DMC).¹ I analyze these arrangements to determine if a specific model is better than the others at creating jobs more efficiently from the public sector's perspective.

Chapter 2 of this thesis is an analysis of the scholarly literature on public-private partnerships for higher education infrastructure. The literature review is broken down into two sections. First, PPPs are examined focusing on how they are defined, possible benefits, concerns, history, current trends, structures, characteristics, and opportunities. Second, higher education infrastructure is examined with a focus on current conditions, opportunities, history, examples, and potential benefits.

¹ The abbreviations used in this thesis for the public-private partnerships are for the purpose of reading this document easily. It should be noted that although CU-ICAR is used by many when referring to this PPP, the other two PPPs are typically not referred to as UW-SLU and LSU-DMC outside of this thesis.

Chapter 3 presents the research design for the thesis. A multiple-case study is used to examine public-private partnerships for higher education infrastructure. The cases selected represent three distinct PPP models. These models are used to analyze public sector job creation efficiency for the purpose of understanding what types of PPP organizational structures or models can create jobs more efficiently than the others. Sections of this chapter include concept definitions, measurements, cases, and challenges and limitations.

Chapters 4-6 are dedicated to the specific cases used in the thesis. Data are presented that highlight the public-private partnership's job creation opportunities. In addition, data are presented that highlight the specific PPP's stability, capacity, and collaboration. These attributes and their connections to a PPP's job creation efficiency are examined. Each chapter is broken down into sections that include an introduction, background information, specific details about the PPP, data focused on job creation, and a conclusion.

Chapter 7 concludes the thesis. In the first section I compare the three cases for their relative job creation efficiency. The cases are examined next to each other for the purpose of determining whether one of the public-private partnership models has the ability to create jobs more efficiently than the others. The scope of this thesis only covers three PPP models and therefore the analysis only reflects which of the three models is able to create jobs more efficiently. In addition, I discuss the proposed Oregon Sustainability Center, which was a failed attempt at a PPP. This discussion reinforces the phenomenon that PPPs are dependent on stability, capacity, and collaboration to create jobs more efficiently. Other limitations to this research are also discussed at this time. The final chapter then has two sections that discuss opportunities for future job creation. The former focuses on PPPs in other industries. The latter focuses on opportunities for further development of higher education infrastructure. I conclude

the chapter and the thesis by suggesting that this research could contribute to more informed policy decisions in regards to PPPs.

Chapter 2

Literature Review

This literature review explores the background of two concepts that are the basis of this thesis. The first section focuses on public-private partnerships. The second section focuses on higher education infrastructure. The scholarly literature available on these topics provides the background necessary to examine the research question that is presented in the following chapter.

Public-Private Partnerships

Today's economic conditions in the United States require both public and private sector action because the problems are too great for either sector to handle alone (Brinkerhoff and Brinkerhoff 2011, 2). A partnership approach to economic problem solving could allow governments to do more with less (Kernaghan 1993, 62). This idea of doing more with less is the reason that governments enter into public-private partnerships (Grimsey and Lewis 2005, 346).

Public-private partnerships could combine the best aspects of both the public and private sectors. Both sectors have characteristics that could contribute to the success of PPPs. Significant factors that the public sector can bring to the partnership are stability and the public's will. Important positive factors that the private sector can bring to the partnership are creativity, an entrepreneurial outlook, increased capacity, and access to capital. The public sector is good at some things, the private sector is good at others, and non-profits also have their advantages (Rosenau 1999, 11).

Moreover, public-private partnerships have the opportunity to benefit both the public and private sectors. PPPs benefit the public sector by bringing in private capital and expertise. PPPs benefit the private sector by bringing in new revenue streams and markets (Southard 2010). With the proper structure, PPPs could present a win-win situation for both sectors.

Public-private partnerships have been encouraged for multiple reasons. First, these partnerships have been created for the purpose of combating public problems that are too great to be solved by one sector acting alone (Stadtler 2012, 78). Second, there is a belief that PPPs will increase good governance because the private sector has better access to capital and risks can be shared by both the public and private sectors (Brinkerhoff and Brinkerhoff 2011, 6). Governments that are strapped for cash are looking for ways to keep services with limited spending. The reputation of the public sector is one that is hampered by waste and inefficiency. The private sector has a better track record when it comes to dealing with waste and inefficiency because the private sector is driven by profit. The private sector could be willing to join into these partnerships because they provide a low-risk investment, but still provide an opportunity for profit (Southard 2010). With government budget's suffering, outside financing looks enticing (Bovaird 2004, 201).

A standard or unified definition of a public-private partnership has not yet been established (Koontz and Thomas 2012, 770). Scholars have defined PPPs in different ways. A broad definition of a PPP is a structured cooperative agreement between public and private sectors. Another broad definition is simply the private sector's participation in the public sector (Brinkerhoff and Brinkerhoff 2011, 3-4). Others have defined a PPP as a working arrangement with a mutual commitment between the public sector and an outside entity (Bovaird 2004, 200). On the narrow end of the spectrum, a PPP has been defined as cross-sector collaboration that

includes shared goals, shared decision making, horizontal organization, relationships that could range from formal to informal, numerous interactions, and shared accountability (Brinkerhoff and Brinkerhoff 2011, 3-4). Another narrow definition of a PPP is where two or more actors, one of which is public, are both represented, both make contributions, have agreed to a long term arrangement, and share the responsibility for the outcome (Gazley 2008, 143).

Globally, public-private partnerships are becoming more popular (Koontz and Thomas 2012, 770; Anderson, Michael and Peirce 2012, 8). The number of public-private partnerships for infrastructure projects is increasing throughout the United States and the world despite the fact that the percentage of these arrangements remains small compared to the number of traditionally public funded infrastructure projects. In Great Britain 10-14% of infrastructure projects are organized as private finance initiatives (PFIs). These PFIs are comparable to PPPs in other parts of the world. In Australia, roughly 10% of infrastructure projects are PPPs. Although there is a growing trend when it comes to infrastructure PPPs, the proportion of these arrangements remains low compared to the total number of infrastructure projects (Grimsey and Lewis 2005, 371).

Public-private partnerships have been around in the United States for a long time. Although not called PPPs originally, some of these first arrangements were electric utilities. These early electric cooperatives highlight how these PPPs can work. In the case of electric cooperatives the private sector was given eminent domain rights and regional monopolies, while the public sector was able to set prices and regulate the industry (Southard 2010).

Even though public-private partnerships are not new in the United States, their expansion into other industries is new. For this reason they could be experimented with to discover how they can be the most effective policy tools (Bovaird 2004, 213-214). More research could be

done to understand how PPPs can best be organized to get the most value for the money spent (Bovaird 2004, 201).

Before a public-private partnership is created, scholars recommend that a specific framework be put in place to increase the chance of success (Rosenau 1999, 25). First, there needs to be a very specific plan created prior to the start of the project. Second, accountability needs to be defined. Third, reachable goals need to be created. Fourth, the incentives for each sector must be presented. Finally, the project needs to be continuously monitored. Overall, PPPs can be successful with the proper structure, but they do require cooperation (Rosenau 1999, 25).

Collaboration is a critical factor for public-private partnerships (Bovaird 2004, 210). Collaboration allows for a mutual solution between organizations in order to achieve a goal that would be impossible or at least more difficult if attempted alone. This collaboration requires partners to, voluntarily and autonomously, pool resources for the overall goal (Gazley 2008, 142). For example, it is important to take advantage of the private sector's knowledge and experience (Willems and Van Dooren 2011, 518). Additionally, collaboration requires mutual planning and management, alignment of goals, equitable investment between partners, shared risks, and shared benefits (Gazley 2008, 142). A successful framework in regards to collaboration includes having clear expectations from the start (Willems and Van Dooren 2011, 518). To collaborate effectively a clear plan that establishes each sector's role is necessary (Rosenau 1999, 25). A public-private partnership requires a little give from both the public and private sectors. The public sector needs to take on more of an entrepreneurial spirit and the private sector needs to keep the public's best interest in mind (Linder 1999, 36-37).

An organization's capacity is fundamental to its success (Hou, Moynihan and Ingraham 2003, 296). However, capacity does not guarantee success, but instead should be regarded as one of several factors related to success (Hall 2008, 113). Adequate capacity is needed to undertake large infrastructure projects (Pisano 2011, 234). Unfortunately, there is no consensus definition of capacity (Bowman and Kearney 1988, 343). Since there is no unified definition, the term capacity should be defined based upon what is being studied (Hall 2008, 110). Public-private partnerships for higher education infrastructure must have enough capacity to meet their goals. The goals that the PPP is attempting to accomplish must be achievable (Rosenau 1999, 25). Therefore, for any PPP to more efficiently create jobs, capacity is a necessity. Capacity will allow for partnerships to endure over an extended period of time.

Stability is essential for a public-private partnership. This idea of stability could also be referred to as sustainability. "Partners must continuously seek improved ways of increasing the sustainability of policies and activities" (Bovaird 2004, 211). To create stability, an upfront, concrete plan that clarifies key decisions is a necessity (Rosenau 1999, 25). A successful framework would have both societal and political support (Willems and Van Dooren 2011, 518). The more the partners are mutually dependent on each other the more likely the partnership will endure for an extended time period and continue to be effective (Kernaghan 1993, 72). An arrangement with the above mentioned attributes would increase the chances of a PPP's stability, which would create opportunities for more efficient job creation.

Public-private partnerships are complex arrangements, and the trend is that they are becoming increasingly more complex (Gazley and Brudney 2007, 411). As a result, the boundaries between the participating actors may become blurred. PPP administration does not follow the same format as typical public sector or typical private sector administration (Moulton

and Anheier 2001, 3). Within these arrangements there are also opportunities for non-profit organizations to be included. Half of the hospitals, universities, and colleges in the U.S. are non-profit organizations (Moulton and Anheier 2001, 5). PPPs could expand into these industries even further. Non-profit organizations cooperating with the public sector could administer more social programs that could promote the general welfare of the country without an increased financial burden on the public sector (Moulton and Anheier 2001, 8). However, with non-profit organizations participating in these partnerships, it adds more complexity to how these partnerships will work. Despite their complexity, partnerships can be effective (Kernaghan 1993, 76).

Clear lines of accountability need to be established due to the complex relationships in public-private partnerships (Rosenau 1999, 25). Traditionally, the public sector is held accountable through political means, judicial means, administrative means, and societal means (Willems and Van Dooren 2011, 510). The private sector is held accountable through economic means and judicial means. When these two sectors are brought together it creates a horizontal administration, which can present an accountability challenge (Willems and Van Dooren 2011, 517). Both sectors need to be responsible for the outcome of the project. This complex accountability could create problems that could prohibit a project's success. Guidelines that could help alleviate this burden include establishing a proper balance of risk, evaluating using a cost-benefit analysis, making sure that there is social and political support, taking advantage of private knowledge and experience, setting clear expectations, and continuing to measure performance (Willems and Van Dooren 2011, 518). Despite numerous positive opportunities that PPPs present there is still some concern over whether they can produce the results that are expected.

Another concern that arises in public-private partnerships is that once an agreement is made the more powerful sector can exploit their role. The public sector often acts as the senior partner because more often than not that is where the funding comes from (Kernaghan 1993, 62-63). However, if the private sector becomes the more powerful partner then they can call the shots (Miraftab 2004, 89). This is more common when the partnership combines the private sector with a local government, which is often the case. Local governments are often times drastically smaller than their private sector partners. Local governments do not have the resources to manage these PPPs and the administrative role is then left to the private sector. In order for a local government partnership to be successful they may need to have backing by the federal government (Miraftab 2004, 93).

Accountability and complexity challenges should not be a deterrent to the creation of public-private partnerships. On one hand, because of the private entities involved, in some cases there have been more innovative project designs and better project management. Conversely, there is a chance for additional costs due to the complexity of the arrangements (Spackman 2002, 298-299). Despite both pros and cons, a study of 20 British PPPs showed that the majority were characterized as being a good value for the money invested compared with other alternatives. The PPPs were implemented across a wide range of contracting areas and the complex partnerships and policies were an administrative and political success (Spackman 2002, 297).

Public-private partnerships are capable of creating jobs with relative efficiency. PPPs could reach this objective because of the opportunity they have to create innovative tools for public administrators. The public sector is looking for greater financial efficiency, which could be achieved through PPPs (Kernaghan 1993, 59-60). The idea of being able to tap into private capital to keep the same level of services with less public cost is also promising. Through a PPP,

if the private sector could use its knowledge and expertise to maintain programs and services at the same time as it lowers costs, then the public sector could benefit by still being responsive to the public's needs at the same time as its financial output is decreased (Linder 1999, 36-37).

Lawmakers have attempted to pass legislation to boost job creation, but have not reached a compromise. A variety of economists are calling for more stimulus dollars to create jobs and boost growth, but the reality is that this type of legislation will not make it through the Republican controlled House (Appelbaum and Cooper 2011). Numerous economists support the 22 jobs bills that have recently moved through the Republican controlled House, but have yet to come to a vote in the Democratic controlled Senate. These bills are designed for private sector job growth (Madhani 2011).

Democrats and Republicans tend to view the government's role in job creation differently. When asked about the best way to create jobs in the U.S., 38% of Republicans and 17% of Democrats supported a more limited government role in job creation. While 11% of Republicans and 25% of Democrats supported a more active government as the best way to create jobs (Newport 2011).

Policies that promote public-private partnerships could represent a compromise between those who favor government intervention and those who favor the free market to create jobs. Political leaders on both sides of the aisle argue that jobs need to be created, but there are disagreements over how this should be done. President Obama introduced his American Jobs Act on September 12, 2011 and a month later explained that the most important challenge facing the U.S. is economic growth and job creation. The American Jobs Act called for a \$447 billion investment into the U.S. economy (Obama 2011). However, the legislation was not passed. House Republicans have emphasized their desire to take every possible step to spur job creation

by following a pro-growth agenda that includes; reducing regulations, tax code reform, patent reform, expanding visas for highly skilled workers, FDA product approval, maximizing domestic energy production, reducing the debt, and an emphasis on free trade (House Republican Conference 2011). The two sides disagree over how job creation should be addressed. PPPs could provide an opportunity for a compromise. Jobs could be created more efficiently with minimal public spending that could promote an environment suitable for further private sector job growth.

Higher Education Infrastructure

Higher education infrastructure provides opportunities for public-private partnership investment. Overall, infrastructure in the U.S. has been neglected. The American Society of Civil Engineers' 2009 report card gives America's infrastructure a D average (American Society of Civil Engineers 2009). There is an opportunity to improve the condition of U.S. infrastructure, which in addition to creating infrastructure jobs could also create job opportunities throughout other industries. Education benefits both the public and private sectors (Levin 1999, 125). PPP cooperation could have the ability to lead to job growth whether the investment is for constructing a new community college workforce training facility or for a new advanced research and development center at a university. Studying PPPs for higher education infrastructure provides insight into the opportunities available for job creation.

Educational infrastructure could create both immediate job growth from the construction of these facilities, as well as long term job growth from increased human capital. Education is an industry where public-private partnerships could create jobs if there was cooperation between

partners that have the same mission. With these PPPs, cooperation between the public and private sectors is essential (Levin 1999, 129).

Education is an industry that has experienced some cross-sector collaboration. On one hand, public funds have been used to support private schools. On the other hand, private businesses have made contributions to public schools (Levin 1999, 124). Both the public and private sectors benefit from education, and cooperation could lead to more educational success (Levin 1999, 125). In order for these educational partnerships to be successful a common mission and common goals need to be established (Carducci and Kisker 2003, 57).

Higher education has an opportunity to benefit from public-private partnerships because of the private investment that it attracts (Bass 2003, 19). The private sector understands colleges can be an extremely important component of regional economic development (Chatterton and Goddard 2000, 475). Communities that are economically healthy are good for business. Recently, corporations have become more focused on sustainable community development and growing educational opportunities than they have been in the past (Googins and Rochlin 2000, 129). Members of these communities make up the corporation's labor force as well as the corporation's consumers. Corporations are among the leading contributors to higher education. For example, community college training programs can benefit corporations and as a result community colleges that offer these types of programs are attractive to private investment (Jackson and Glass 2000, 732). Small and mid-sized businesses have also recognized the attractive nature of community colleges for workforce training and community development. There are numerous examples where the private sector has created successful partnerships with community colleges to create state of the art technology that can be used for up to date training

(Carducci and Kisker 2003, 55-56). The private sector incentive is the creation of a skilled labor force and overall economic growth for the region.

Community colleges have a unique place in the U.S. educational system because they are at the crossroads of training and employment. More and more community colleges are offering contract training courses for specific businesses, industries, labor organizations, and public agencies (Kane and Rouse 1999, 67). In the 1990s, nearly 90% of community colleges were providing specific training courses and not just generic college curriculum (Carducci and Kisker 2003, 55). In addition, workforce training, remedial education, and continuing education courses benefit the local community's economy (Bass 2003, 17). This benefit to the community, specifically the private sector, creates an incentive for the private sector to invest in community colleges.

In 2008, the President's Council of Advisors on Science and Technology (PCAST) recommended federal support for R&D to create an environment that will attract private investment (President's Council of Advisors on Science and Technology 2008, 5). In the report, fourteen PPPs were highlighted that described the partners that were involved, the specific focus of the R&D, the education components, the technology transfer capabilities, and other characteristics. Some of these PPPs were General Electric's USA Program, Intel's Lablets, and Siemens TTB (President's Council of Advisors on Science and Technology 2008, 52). Even though all of these PPPs are not focused directly on job creation, the benefits of the R&D could create jobs in the future because of the increase in human capital. More involvement by the federal government could create an environment where more private investment occurs.

There have been numerous successful public-private partnerships for higher education, but there is still room for expansion. In Flint, Michigan, Charles Stewart Mott Community

College partnered with local businesses and nonprofits as well as the local, state, and federal government. Together, they created the Regional Technology Center (Bass 2003, 21). In Hartford, Connecticut, Capital Community College partnered with local businesses and the local and state governments. Between the college president and the governor they were able to relocate the college to downtown Hartford as part of an urban revitalization effort (Bass 2003, 21-22). In Hagerstown, Maryland, Hagerstown Community College created a partnership with local industries and government officials. In 1990, the college opened its Advanced Technology Center. The purpose was to boost the region economically by making local businesses more competitive through technical workforce training and technical assistance (Carducci and Kisker 2003, 62). In North Carolina, the Life Science Manufacturing Initiative developed partnerships much like the previous examples, but did so throughout the entire state. Life science manufacturing firms throughout the state cooperated with community colleges that are part of the state's BioNetwork Program (Lowe 2007, 343-344). In Austin, Texas, the University of Texas' Cockrell School of Engineering partnered with Emerson Process Management to upgrade the school's research pilot plant at the J.J. Pickle Research Campus. The Separations Research Program runs the facility and one of the program's goals is to enhance public-private cooperation for the purpose of advancing R&D to improve the country's technology base (Cockrell School of Engineering 2010).

This review of the literature demonstrates that several factors must be present to develop public-private partnerships for higher education infrastructure. First, there needs to be recognition of a problem that requires collective action between organizations. Second, a unified mission or goal is essential. Third, all parties involved need to benefit from the partnership. Fourth, strong leadership must be present to provide guidance and direction through the

complexities. Finally, governance and accountability must be shared in an acceptable framework (Carducci and Kisker 2003, 57-59).

Public-private partnerships can continue to be beneficial with support by policy makers. The partnerships work because the public sector wants sustainable development and the private sector wants a skilled workforce (Googins and Rochlin 2000, 138). For colleges to continue to benefit from these partnerships they need to continue to take a leading role in pursuing partners in the private sector (Jackson and Glass 2000, 740). The trend of smaller government budgets will require public colleges to seek other methods of collecting revenue. This will necessitate the pursuance of the private sector for support (Bass 2003, 16). In this time of shrinking government budgets and politicians looking for more value for their money PPPs can represent a solution (Googins and Rochlin 2000, 128). Politicians from both sides of the aisle could address job creation policies that do not overstep their ideologies.

The literature reviewed suggests that public-private partnership models that have stability, capacity, and collaboration have the ability to create jobs more efficiently than PPP models that do not include these characteristics. The public sector contributes stability and the public's will, while the private sector contributes creativity, an entrepreneurial outlook, and access to capital. Public-private partnerships that take advantage of these characteristics have the ability to create jobs more efficiently from the public sector's perspective.

Chapter 3
Research Design

I use a multiple-case study to examine the following research question. Is there a specific public-private partnership model that can create jobs more efficiently than other models? Three cases that focus on public-private partnerships for higher education infrastructure projects each illustrate distinct public-private partnership models. These models are analyzed to determine whether one of the models is more efficient than the others at creating jobs at a lower cost from the public sector's perspective.

I argue that stability, capacity, and collaboration in public-private partnerships are essential to create jobs more efficiently. PPPs can harness the strengths of both the public and private sectors. The public sector contributes stability and the public's will, while the private sector contributes increased capacity, creativity, and access to capital. As we have seen, the literature suggests that public-private partnerships have the ability to create jobs more efficiently when these characteristics are present.

This chapter clarifies and defines key concepts that will be utilized throughout the thesis. I discuss data collection methods for both quantitative and qualitative data. Then, I present the purpose for using a multiple-case study, and I address the criteria for choosing the cases. Each of the cases is briefly described. Finally, I conclude this chapter by discussing limitations to this research design.

Concept Definitions

Public-private partnerships have taken on numerous definitions. On the narrow end of the spectrum, PPPs could be defined as cross-sector collaboration that includes shared goals, shared decision making, horizontal structuring, relationships that could range from formal to informal, numerous interactions, and shared accountability (Brinkerhoff and Brinkerhoff 2011, 3-4). PPPs by nature are flexible arrangements and this narrow definition does not allow for all arrangements that could be considered PPPs to fit the definition. I decided to use a broad definition of a PPP since the focus of this thesis is on job creation. This allows for the analysis of a wider variety of arrangements, some of which could have the ability to create jobs more efficiently. PPPs are defined as, “.....working arrangements based on a mutual commitment between a public sector organization with any organization outside of the public sector” (Bovaird 2004, 200). This is the definition that is used for this thesis because the focus is on job creation.

Higher education infrastructure is a key concept that is used throughout this thesis and therefore the definition should be established. Higher education refers to postsecondary education. Infrastructure refers to physical structures or facilities. Therefore, higher education infrastructure that is analyzed as part of this thesis is a college or university facility. Higher education can be important for a region’s economy (Chatterton and Goddard 2000, 475). All of the cases focus on academic facilities at higher education institutions. Other public-private partnerships for higher education infrastructure have been established for facilities such as housing and parking, but the focus for this thesis is on academic facilities. Academic facilities have the opportunity for increasing human capital. Infrastructure investment, at very least, can potentially create temporary construction jobs during the building stages of the process (Fox and Porca 2001, 104). Building housing facilities and parking lots would create jobs, but building

academic facilities creates an opportunity for knowledge growth. The increased human capital that comes out of higher education academic facilities can be a driving factor for a region's economic development (Chatterton and Goddard 2000, 475). In addition, quality infrastructure assists commerce, supports competitive markets, increases communication of ideas and innovation, and allows resources to be easily accessible (Organisation for Economic Cooperation and Development 2010, 91).

The concept of efficiency is important for this thesis, and therefore the way it is used and defined is presented and clarified. Efficiency is a comparison of benefits and costs (Boarnet 2001, 243). Whenever the concept of efficiency is used in this thesis, it is always analyzed from the public sector's perspective. The comparison is between the number of jobs created (benefits) and the public investments (costs). The more jobs that are created and the fewer tax dollars that are spent on a project, the more efficient the project is from the public sector's perspective. The job creation efficiency of the three public-private partnership models is presented in charts and the text.

Stability, capacity, and collaboration are discussed as essential characteristics for public-private partnerships to create jobs more efficiently thus they should be defined. First, stability refers to the PPP's commitment and ability for the various actors to remain partners. For example, stability would increase from support by the public sector as well as access to capital from the private sector. Mutual benefits between partners increase the chances of a lasting partnership (Kernaghan 1993, 74). Second, capacity refers to an organization's capabilities. Capacity is a broad term that encompasses an organization's ability to change, to make good decisions, to develop and then implement policy, to bring in resources and use them accordingly, and to evaluate itself and plan for the future (Honadle 1981, 577). A PPP without adequate

capacity would have difficulty meeting its goals. Third, for this thesis collaboration refers to the PPP's commitment and ability to bring the various actors together for the purpose of working toward its goals. Collaboration falls somewhere between limited cooperation and complete coordination (Gazley 2008, 142). Collaboration at its best would be seen by uniform goals, consensus decisions, a horizontal power structure, trusting relationships, interactions between partners, and shared accountability (Brinkerhoff and Brinkerhoff 2011, 4). Collaboration can occur at the planning and design phase of a project or the program implementation phase.

According to the scholarly literature there are a number of characteristics that are essential for the success of public-private partnerships. I chose to study stability, capacity, and collaboration and their connection with more efficient job creation. Having these three characteristics appear to be a minimum requirement for a PPP to create jobs more efficiently. The characteristics of stability, capacity, and collaboration encompass the foundation of a solid structured PPP and without them relatively efficient job creation would be extremely difficult. This phenomenon is discussed throughout this thesis.

The definition of jobs and how jobs are presented and described in this thesis is important. A job is simply an employment position that is filled (Davis, Haltiwanger and Schuh 1996, 9). The data collected represent many different types of jobs; although the data are not always clear about the types of jobs created, the data analysis attempts to clarify this as much as possible. Some of the jobs created, especially during the construction stages of the projects, are temporary jobs. Other jobs are long term or permanent in nature. When the data provide enough insight into the duration of the job, this information is provided. Jobs are also distinguished throughout the thesis as being direct, indirect, and induced when the data are available. Direct jobs are created specifically by the project. Indirect jobs are created through suppliers that are

used for the specific project. Induced jobs are created because of the economic effects from the project (Executive Office of the President: Council of Economic Advisors 2009). For example, direct jobs could refer to someone who is employed for the construction of the facility or someone who is employed in research and development at the facility because of the PPP. Indirect jobs could include jobs that are created at a firm because of a contract with the PPP to supply building materials. Induced jobs could include service sector jobs that are needed because of the increase in economic activity in the region. When describing the jobs created some emphasis is placed on the specific types of jobs. Also, although specific salaries or pay is not mentioned in the data, when the data show that the jobs created would be characterized as high paying jobs, this information is noted.

For this thesis, the term expenditure is used interchangeably with costs. When expenditures are noted throughout the thesis, this refers to the dollars spent by the public-private partnership. Most of the expenditures by the PPPs are for facility construction because the nature of this thesis is on higher education infrastructure. When there are data available that discuss the PPP's expenditures this information is presented.

Measurements

Quantitative data are used to highlight the number of jobs created and the amount of money invested by the differing partners. The data were collected through Internet sources that focus on the respective public-private partnership. Articles, studies, reports, websites, and press releases from both the educational institution and private industries are used as the main sources. The data are used to compare the PPP's job creation efficiency relative to the other PPPs.

Qualitative data are used to highlight how the three public-private partnerships presented tap into more efficient job creation. The data were collected through Internet sources that include articles, studies, reports, websites, and press releases. The qualitative data collected focus on the characteristics of the PPPs. The data are used to discuss whether the characteristics of stability, capacity, and collaboration are present in the specific public-private partnership models and whether they are necessary for efficient job creation. This thesis only discusses whether these characteristics are present in a specific partnership and not the intensity of a characteristic in the partnership.

Cases

Using a multiple-case study presents both advantages and potential drawbacks. On one hand, the cases provide real world examples to analyze. On the other hand, the nature of case studies is that numerous variables can enter the scenario creating difficulties when attempting to reach conclusions. For this thesis the pros outweigh the cons. Using real world examples to analyze job creation opportunities of public-private partnerships for higher education infrastructure provides insight into their viability as a policy option.

Three cases are included in the multiple-case study. The first case highlights Clemson University's International Center for Automotive Research. The second case highlights the University of Washington's South Lake Union Medical Research Complex. The third case analyzes Louisiana State University's Digital Media Center.

I selected these three cases because they each represent a distinct public-private partnership model and each partnership has claimed to have created jobs. Selecting cases that have both created jobs and represent a distinct organizational structure focuses the thesis on

examining the research question. The three models highlight the flexibility of PPPs. CU-ICAR is backed by profit-driven private industry. UW-SLU is supported by non-public, non-profit, philanthropic donors. LSU-DMC represents a distinct model because the upfront investment for the project comes entirely from the public sector, with one private sector tenant committing to a six year deal where they will invest by renting the facility. These cases are distinct in the way that the partnerships are arranged. Each provides a somewhat different PPP model. These three distinct cases contribute to the strength of the thesis by providing different real world situations to analyze.

These cases are presented using an embedded case study design. Embedded case study designs allow for subunits within the case studies to be analyzed (Yin 2009, 50). The subunits are used to analyze the public-private partnership's relative job creation efficiency and to discuss the PPP's characteristics. By using an embedded case study design rather than a holistic approach for presenting the cases, the focus is on analyzing relative job creation efficiency and discussing the PPP's characteristics.

The individual cases are analyzed in the following three chapters. Each chapter is dedicated to one of the three higher education public-private partnerships. Each chapter is broken down into five sections; an introduction, background information, the PPP's structure, job creation aspects, and a conclusion. An additional chapter compares the three cases and presents conclusions to the research question.

Challenges and Limitations

One of the challenges to this research design was choosing cases that represented distinct public-private partnership models, but at the same time fit the definition of a PPP. I addressed

this challenge by choosing a broad definition of a PPP, which allowed for a wider range of PPP models to choose from. By using the definition of a PPP where a public sector partner and a partner outside of the public sector work together in collaboration, I was able to select cases that would be relevant to the research question. The distinct models that each case represents can then be compared to each other for the purpose of determining which model can create jobs the most efficiently. This allows for a better understanding of the effectiveness of PPPs for higher education infrastructure.

Another challenge was to collect enough data to accurately examine the relationship between public-private partnerships and more efficient job creation. This was difficult because the data were not always easy to access. The articles, studies, reports, websites, and press releases used as sources were not always straightforward, some of them presented conflicting data, and much of the data come from sources that have an interest in putting a positive spin on the specific public-private partnership. Therefore, it is important when analyzing the data that the sources are taken into account. If accurate, comparable data were easy to access, then this research may not even be necessary. The challenge was collecting enough accurate data to be able to examine the research question.

One limitation to this research design is that the cases presented may not always reflect what could happen if public-private partnerships for higher education are encouraged as a policy option in the future. These cases can provide a better understanding of which type of PPP model can create jobs more efficiently, but that does not mean that PPPs are the only option for job creation or even that they will always work. Changes in economic conditions occur due to numerous variables and the cases presented will not be able to account for, or be able to isolate, all of the variables. For example, jobs could supposedly be created directly because of a PPP,

but if tax incentives already were in place, then it becomes difficult if not nearly impossible to determine if a private firm that is part of the PPP created jobs because of the tax incentives or because of the PPP. Also, just because the PPP studied has stability, capacity, and collaboration; it does not necessarily mean that more efficient job creation will always occur. These characteristics are more of a minimum requirement for a PPP to have the opportunity to create jobs more efficiently.

Finally, another limitation to this thesis is that its scope only allows for the analysis of a limited range of job creation policies. The conclusions are made based on the analysis of the three public-private partnership models' relative efficiency at job creation. This limitation was addressed by focusing the research question on the three distinct PPP models. The purpose of this research is not to determine the best policy option, but rather which of the three models presented is more efficient at creating jobs from the public sector's perspective. Therefore, justifiable conclusions on the viability of these policies can be made based on the analysis presented. This thesis could provide the framework for further research that could be undertaken to analyze more job creation policies.

Chapter 4

Clemson University's International Center for Automotive Research (CU-ICAR)

CU-ICAR Introduction

This chapter analyzes Clemson University's International Center for Automotive Research (CU-ICAR) as a public-private partnership model. The following research question is the primary focus of the thesis and therefore the analysis of the PPP is focused in that direction. Is there a specific public-private partnership model that can create jobs more efficiently than other models? The structural stability and social responsiveness of the public sector and the increased capacity, represented by the creative entrepreneurial attitude and access to capital, of the private sector could provide an opportunity for a PPP for higher education infrastructure to create jobs more efficiently if the two sectors collaborate. The literature reviewed suggests that stability, capacity, and collaboration are necessary for PPPs to create jobs more efficiently and this phenomenon is further discussed throughout this chapter.

I chose CU-ICAR as a case because it represents a distinct public-private partnership model where a substantial amount of capital was invested upfront by both the public and private sectors for the initial infrastructure. This investment created the infrastructure and the environment for further private sector investment. The PPP at CU-ICAR is a cooperating agreement primarily between Clemson University and a few private firms. However, the partnership also brings in other levels of the public sector and other private firms that have played a lesser role in the partnership.

The rest of this chapter highlights the public-private partnership at CU-ICAR and its job creation abilities. A brief overview of the program is presented. Then CU-ICAR is analyzed as

a public-private partnership. Next, the PPP is evaluated based on its ability to create jobs more efficiently. Finally, the chapter ends with some concluding remarks about the characteristics necessary for more efficient job creation.

CU-ICAR Background

The mission at CU-ICAR is, “To be the premier automotive and motorsports research and educational center in the world” (Clemson University 2010a). The CU-ICAR campus is a hub for research collaboration among academia, industry, and government that fuels innovative knowledge for the automotive industry (Clemson University 2012a).

CU-ICAR is a 250 acre campus located in Greenville, South Carolina off of I-85 that consists of 760,000 square feet of building space and another 332,000 square feet of building space is in the development stage. Four buildings are currently occupied including the CU-ICAR AutoPark & Innovation Place, BMW Information Technology Research Center, Carroll A. Campbell Jr. Graduate Engineering Center, and Koyo JTEKT (Clemson University 2012c). The CU-ICAR AutoPark & Innovation Place construction cost was \$21.6 million, the Carroll A. Campbell Jr. Graduate Engineering Center construction cost was \$43 million, and the Koyo JTEKT building’s construction cost was \$18 million (Clemson University, 2012e). In addition, the Center for Emerging Technologies, opened in 2011, will eventually contain multiple emerging and established companies (GSA Business 2011). These costs do not represent all of the investment at CU-ICAR, but the infrastructure construction seems to be a one-time expenditure.

CU-ICAR's Public-Private Partnership

The public-private partnership at CU-ICAR provides an opportunity for more efficient job creation. The PPP appears to have the important characteristics of stability, capacity, and collaboration. CU-ICAR has done an exemplary job at collaborating between the public and private sectors. The partnership consists of multiple levels of government as well as the private sector (Anderson Independent Mail 2011). The stability at CU-ICAR generates confidence for both public and private sectors to invest time and money. The success that the partnership has achieved can be partly attributed to the connections, relationships, and networks that have been established (GSA Business 2011). Capacity at CU-ICAR is shown by the private firms that made a commitment to become founding partners. These firms include American Titanium Works, AT&T, BMW, JTEKT, Michelin, Proterra, and Timken (Clemson University 2012d).

CU-ICAR's original private partner was BMW. Prior to their partnership, BMW opened a manufacturing plant in Spartanburg, South Carolina in 1994 (Hemmes 2010). The overall incentive package that South Carolina offered BMW to locate in their state was worth over \$130 million (Nash 2011, 20). Then in 2003, BMW partnered with Clemson University. BMW is committed to education, research, and development (BMW Manufacturing Co. 2012). At the BMW Information Technology Center, collaboration occurs between engineers and students frequently. These individuals have numerous opportunities to work side by side on innovative projects (Clemson University 2012b).

Other transportation manufacturers are beginning to collaborate with CU-ICAR. For example, Proterra plans to build a state of the art research and development and manufacturing facility for fast-charge, battery-electric, heavy-duty transit buses (Proterra 2012). Another private firm that has partnered with CU-ICAR is Timken. They are known as a global leader in

manufacturing bearings, alloy steels, and components and assemblies related to the movement of equipment (Timken 2012). Timken has been a partner with CU-ICAR since 2006 when they made a \$3 million contribution to support the university's graduate program (Timken 2006).

CU-ICAR for Job Creation

Even though the overall mission at CU-ICAR is to create the world's best education and research center for motor sports and the automotive industry, the indirect results are the creation of jobs (Clemson University 2012c). "CU-ICAR has been a model for economic development" (Clemson University 2011).

According to Clemson University, CU-ICAR has announced the creation of over 2,300 high-wage jobs. Since 2003, when ground was broken at CU-ICAR, over 760,000 square feet of building space has been constructed. As a result, jobs have been created during the construction stages of CU-ICAR (Clemson University 2012c). Jobs have also been created by private industries that have created research and manufacturing facilities in these buildings.

Proterra has announced that they will add 1,300 jobs due to the expansion of their manufacturing facility at CU-ICAR (Arend 2010). These jobs will require skilled workers for positions in mechanical assembly, warehouse, logistics, management, engineering, and quality assurance (Clemson University 2010b). Proterra plans to expand their production facility at CU-ICAR from being able to manufacture 100 buses per year to 400 buses per year (Proterra 2012). The company will invest \$68 million in the region (Arend 2010). Also, with the help of GM, Proterra has focused on lean manufacturing techniques to improve efficiency and cut down on waste by moving some manufacturing to outside suppliers. This has contributed to the creation of regional jobs outside of the production facility. Proterra has gone from zero South Carolina

suppliers and vendors to 75 since their move to Greenville in 2010. In addition, there have been 22 new positions already created at the Proterra facility (Proterra 2012).

American Titanium Works has announced that it will create nearly 400 jobs and invest \$420 million in the region (Mitchell 2011). American Titanium Works will form their applications development and engineering technical center at CU-ICAR, which will create 40 applied engineering jobs. This research and development is connected to their plans to construct a new titanium mill in the region that will house an estimated 320 new employees (Trade & Industry Development 2012).

When analyzing CU-ICAR for job creation efficiency the characteristics of stability, capacity, and collaboration stand out. First, CU-ICAR has stability. Having a common mission and common goals contributes to this stability. CU-ICAR strives to be the best in the world at education and research for the automotive industry. This idea is shared by both the university and the private firms that have joined the partnership. Second, adequate capacity is an incentive for the private sector to get involved in the partnership. The automotive industry is constantly changing and research and development is important. Therefore, private firms have an incentive to be part of CU-ICAR. Third, Clemson University has an enormous incentive to collaborate with the private sector. Students and faculty can work with automotive engineers on a daily basis and as a result better understand the industry. The outcome of this arrangement is an opportunity to create jobs with relative efficiency from the public sector's perspective.

Table 4.1 Financial contributions for CU-ICAR from various partners in millions of dollars.

Public Dollars Invested	Private Dollars Invested	Investor
26.4		Clemson University and Clemson University Real Estate Foundation
95.5		South Carolina and Local Governments
18	18	State and Private Industry Partnerships (50/50)
	55.8	Private Industry
	19.7	Private Industry (for equipment)
139.9	93.5	Sector Totals (\$233.4 million)

Source: (Clemson University 2012c)

Note: This table shows where the initial investments in CU-ICAR originated.

Both the public and private sectors have invested a substantial amount of capital in CU-ICAR. Various public sector entities initially invested \$139.9 million in CU-ICAR. Various private sector entities initially invested \$93.5 million in CU-ICAR (Clemson University 2012c). Large capital investments by both the public and private sectors contribute to shared responsibility and shared risk. With shared responsibility and shared risk comes the necessity of the partnership to have adequate capacity. Both sectors rely on the public-private partnership to have adequate capacity. The \$93.5 million initial investment by various private entities also shows access to capital that is essential for a partnership to flourish (Clemson University 2012c). In times of dwindling public coffers, access to capital is important, and without that capital job creation becomes more difficult if not impossible. Capacity is an essential characteristic for a public-private partnership to create jobs more efficiently.

The initial investment in CU-ICAR for land, infrastructure, and buildings amounted to \$145.5 million (Przirembel 2005). A substantial amount of physical component investment

shows commitment and stability. Land, infrastructure, and buildings are typically not short term investments. Both the public sector and private sector made substantial financial commitments to the construction of the facilities. This shared risk and responsibility and the necessity of adequate capacity are vital attributes for a public-private partnership to more efficiently create jobs.

Table 4.2 Job creation at CU-ICAR.

	Number of Jobs Created	Public Costs + Private Costs Total Costs	Private Sector Cost Per Job	Public Sector Cost Per Job (Public Sector Efficiency)
Jobs already created	680	\$139,900,000 <u>\$ 93,500,000</u> \$233,400,000	\$137,500	\$205,735
Jobs created plus estimated indirect jobs	1,747*	\$139,900,000 <u>\$ 93,500,000</u> \$233,400,000	\$53,520	\$80,080
Announced jobs plus estimated indirect jobs	6,116*	\$139,900,000 <u>\$561,500,000</u> \$701,400,000	\$91,808	\$22,874

Source: (Clemson University 2012c; Battelle Technology Partnership Practice 2007; Mitchell 2011)

Notes: The table highlights jobs already created at CU-ICAR, estimated indirect and induced jobs, and announced jobs at CU-ICAR. In addition, the table breaks down public and private sector costs per job.

**A multiplier of 2.57 jobs per employee is used based on the Bureau of Economic Analysis Direct-Effect Employment Multiplier (Battelle Technology Partnership Practice 2007).*

Clemson University reports that 680 jobs have already been created on-site (Clemson University 2012c). The additions of 1,300 announced jobs from Proterra and 400 announced jobs from American Titanium Works brings the total announced jobs at CU-ICAR to 2,380. The \$68 million investment from Proterra and the \$420 million investment from American Titanium Works highlight the success of the initial public-private investment at CU-ICAR (Mitchell

2011). The initial investment created infrastructure needed to court private enterprise in order to invest in the facility and the region.

If indirect and induced jobs are added into the equation, the number of jobs created increases substantially. On average, research parks create 2.57 indirect jobs for every research park employee.² University research parks are developments that allow both public and private sector research and development to take place in one location for the purpose of collaboration and innovation (Battelle Technology Partnership Practice 2007). CU-ICAR is a prime example of a research park and therefore the multiplier used to estimate indirect job creation seems fair. Using the 2.57 multiplier would provide an estimate of 1,747 jobs that have already been created and an estimate of 6,116 jobs that will be created with the additional investments by Proterra and American Titanium Works. The public-private partnership at CU-ICAR has been and will continue to be a relatively efficient job creation mechanism from the public sector's perspective.

The public-private partnership at CU-ICAR has eased the financial burden of the public sector by bringing in private investment. The public sector's share per on-site job created at CU-ICAR is \$205,735. However, an estimated 1,747 jobs have been created if indirect and induced jobs are included making the public sector's share \$80,080 per job. After the initial public-private investment to lay the foundation for CU-ICAR, the majority of further investment will come from the private sector. This phenomenon is highlighted by the announced investments from Proterra and American Titanium Works, which, including estimated indirect and induced jobs, would bring the total jobs created from CU-ICAR to 6,116 making the public sector's share \$22,874 per job. Private sector investment takes financial pressure off of the public sector. PPPs are a way for jobs to be created without the government paying the entire bill. If the public

² The 2.57 indirect jobs per research park employee multiplier comes from the Bureau of Economic Analysis Direct-Effect Employment Multiplier.

sector and private sector establish PPPs for the creation of infrastructure necessary for further private investment, then PPPs can more efficiently create jobs.

Clemson University claims that the economic impact from CU-ICAR has contributed in part to multiple regional projects in the development stage. The Verdae Development will consist of 1,100 mixed use acres with an expected population of 10,000 (Clemson University 2012c). Verdae is a planned community with residential and commercial buildings and an abundance of recreation (Verdae Development, Inc. 2011). The construction of the Hubbell Lighting Corporate Headquarters was an investment of \$36 million and created 350 new jobs (Clemson University 2012c). Hubbell Lighting moved their headquarters from Spartanburg, 26 miles away, to Greenville (Hubbell Lighting, Inc. 2012). The St. Francis Health System will be a 50 acre medical complex that will create 500 new jobs (Clemson University 2012c). Although indirect job creation is briefly mentioned here, the scope of this thesis cannot do justice to how CU-ICAR can effect regional job creation.

CU-ICAR Conclusion

CU-ICAR has created jobs with relative efficiency from the public sector's perspective. The mission at CU-ICAR is to become the best education, research, and development center for the automotive and motor sports industry. However, when analyzing this public-private partnership the primary question is whether CU-ICAR has created jobs efficiently. In response to whether CU-ICAR's PPP has been relatively efficient at job creation, the answer is yes. There have already been 680 jobs created at CU-ICAR, but that is just the start. Eventually, after private investments by Proterra and American Titanium Works, the estimated number of jobs

created including indirect and induced jobs could reach 6,116, driving the public sector's cost per job even lower.

Stability, capacity, and collaboration are present at CU-ICAR and therefore the public-private partnership and the model that it represents have the opportunity to create jobs more efficiently. Stability is a characteristic that has developed out of both the public and private sector's commitment to the program. This is seen with the substantial amount of capital invested from both sectors. Without adequate capacity it would be difficult for the private sector to make a profit. The influx of private investment highlights the capacity of the public-private partnership. BMW, Michelin, Timken, Proterra, and other private firms have an incentive to make a profit. These private firms are willing to invest in research and development at CU-ICAR. They would not invest their capital at CU-ICAR if the PPP did not have adequate capacity. This is seen with the passion that these private firms have in creating innovative solutions to lead their industry. Since private firms are profit-driven enterprises, then PPPs need adequate capacity to be able to meet the needs of private firms or there is no incentive for private firms to collaborate. Collaboration is an essential characteristic due to the complex nature of PPPs. CU-ICAR has been successful at the collaboration aspect of their PPP and as a result it has been a relatively efficient job creation mechanism for the region.

Chapter 5

University of Washington's South Lake Union Medical Research Complex (UW-SLU)

UW-SLU Introduction

I chose the University of Washington's South Lake Union Medical Research Complex (UW-SLU) as a case because it provides insight into a public-private partnership model where most of the non-public investment came from non-profit philanthropy. Even without profit-driven private sector investment, the PPP that was created for the construction of the facility has led to relatively efficient job creation from the public sector's perspective. UW-SLU is a public-private partnership in a broad sense. A narrower definition of a PPP, one that suggests collaboration should be present throughout the entire partnership, may not fit UW-SLU. In this case, the significant non-public investment came during the construction of the facilities. Beyond construction, if one were to look at the programs at the medical research complex one would primarily see the public sector at work. For this thesis the broad definition of a PPP is used, which encompasses any partnership where there is non-public sector investment in traditionally public sector work.

The public-private partnership at UW-SLU is analyzed to determine if it can create jobs with relative efficiency. The characteristics of stability, capacity, and collaboration at UW-SLU are also discussed. The literature reviewed suggests that the structural stability and social responsiveness of the public sector and increased capacity, represented by the creative entrepreneurial attitude and access to capital of the private sector, could provide an opportunity to create jobs more efficiently if the two sectors collaborate. The chapter starts by looking at the expanded medical research campus that was created in the South Lake Union neighborhood. The goals of the construction are highlighted. There is a discussion over the characteristics that

can create jobs more efficiently from the public sector's perspective. Specifically, what characteristics did the PPP at UW-SLU have that made it relatively efficient at creating jobs? Next, job creation from the PPP is analyzed. The data on the number of jobs created is used in connection with the capital investments made to determine whether the PPP was a relatively efficient job creation mechanism. Concluding remarks follow that address whether the PPP at UW-SLU should truly be classified as a PPP based on the definitions presented in the literature review.

UW-SLU Background

The University of Washington's School of Medicine needed room to expand. As a result, it refurbished an old building and constructed new buildings in Seattle's South Lake Union neighborhood. The school needed high quality lab space and it needed it quickly. Without room to expand on its current campus it expanded into the South Lake Union neighborhood. When completed, the new complex will be a hub for medical research (Gianopoulos and Morelli 2009). "South Lake Union is key to UW Medicine's ability to lead a significant portion of the nation's biomedical research enterprise well into the 21st Century" (University of Washington 2012).

Construction of the research complex was broken down into three phases. The first phase renovated an existing building and opened in January of 2005 (University of Washington 2011). The building was the former Washington Natural Gas Building and was renamed the Brotman Building. The second phase of the project added 170,000 square feet of laboratory and office space (Michelson 2012). The second phase was a new construction of offices and labs that opened in June of 2008. The third phase has not been completed, but will consist of three new buildings totaling 542,000 square feet. This phase is expected to be completed in the spring of

2013 (University of Washington 2011). The first phase construction costs were \$38 million, the second phase construction costs were \$160 million, and the projected third phase construction costs are \$165 million (National Development Council 2011). Since these investments are primarily for infrastructure construction, the costs seem to be one-time expenditures.

The expansion of the University of Washington's School of Medicine into the South Lake Union neighborhood is expected to create both short term and long term jobs. Although the primary purpose of the expansion is not to create jobs, jobs will be created because of the construction of the facility. Direct jobs will be created from the renovation of older buildings as well as the construction of new buildings. Indirect jobs will be created from the research and education at the facilities. In addition, the facilities can contribute to regional development that will impact job creation (University of Washington 2011).

UW-SLU's Public-Private Partnership

There was collaboration during the initial stage of construction at UW-SLU (Gianopoulos and Morelli 2009). The partners involved in the project include Vulcan Real Estate as the developer, Perkins and Will as the architectural firm, Sellen Construction as the general contractor, Turner Construction as the construction partner for phase one, and the National Development Council for the project financing (University of Washington 2011). The National Development Council is the non-profit organization that owns the project, which achieved financing through selling bonds. These partners were able to work together to produce a top notch education, research, and development facility that will benefit the University of Washington's School of Medicine for years to come. By focusing on a common goal these

partners were able to collaborate in the construction of this research complex (Gianopoulos and Morelli 2009).

The collaboration of UW-SLU occurred primarily during the construction of the facilities. In this case, the purpose of the public-private partnership was to develop and finance and not necessarily on collaboration after the construction of the facilities (Gianopoulos and Morelli 2009). If defining a PPP narrowly, in that collaboration needs to occur between both public and private sectors throughout the entire program, then UW-SLU might not be considered a PPP. However, if defining a PPP broadly, in that an organization outside of the public sector invests in a typical public venture, then UW-SLU does fit as a PPP. For this thesis the broad definition of a PPP is used and since there has been non-public investment in the construction of UW-SLU it should be considered a PPP.

In addition to the previously mentioned partners, there have also been individual philanthropic donors throughout the three phases of construction. “Philanthropy has been a critical piece to the funding strategy for UW Medicine’s research complex at South Lake Union” (University of Washington 2011). The first phase included a philanthropic investment from Jeffrey H. Brotman. The second phase included philanthropic investments from Tom and Sue Ellison, Lynn and Mike Garvey, the Oki Foundation, Quellos, Safeco, and the Orin Smith Family Foundation. The third phase is seeking investors with a goal of \$50 million, \$15 million of which has already been given by an anonymous donor (University of Washington 2011). When private individuals and entities are willing to invest capital in the project then stability is created and stability is important for PPPs to be able to create jobs more efficiently.

UW-SLU for Job Creation

The job creation impact of the third phase of the project alone is substantial. An estimated 2,000 jobs will be created directly as a result of the third phase. These jobs include over 1,400 University of Washington jobs and due to the construction portion of the phase 600 union construction jobs will be created. In addition, an expected 3,000 regional jobs will be created indirectly because of the economic impact from the facility (University of Washington 2011). The 5,000 jobs that are expected to be created from the third phase of UW-SLU will bring the public sector cost per job to \$23,000 (University of Washington 2011).

By the end of all three phases of the project over \$360 million will be invested, much of which comes from non-public investment in the form of philanthropic donations. Philanthropic donors benefit by contributing to the improvement of the public's overall health (Ramsey 2010). In addition, name recognition for philanthropic donors creates a benefit in its own right. For example, the Brotman Building's name comes from the leading private donor for the first phase of the project (University of Washington 2011).

Table 5.1 Total investment for the three phases of UW-SLU in millions of dollars.

Total Invested	Phase
38	Phase 1
160	Phase 2
165	Phase 3

Source: (National Development Council 2011)

Note: This table shows total investments in millions of dollars made during each phase of the project.

The public sector costs for phase three of the construction will be \$115 million, if the \$50 million non-public fundraising goal is met (University of Washington 2011; National Development Council 2011). Bringing in outside capital eases the burden on public funds,

which are becoming increasingly more difficult to attain for public projects. In addition, this \$50 million highlights adequate capacity of the PPP.

Table 5.2 Job creation for phase three of UW-SLU.

	Number of Jobs Created	Public Costs + Private Costs Total Costs	Private Sector Cost Per Job	Public Sector Cost Per Job (Public Sector Efficiency)
Estimated direct jobs created	2,000	\$115,000,000* \$ 50,000,000 \$165,000,000	\$25,000	\$57,500
Estimated direct and indirect jobs created	5,000	\$115,000,000* \$ 50,000,000 \$165,000,000	\$10,000	\$23,000

Source: (University of Washington 2011)

Notes: This table shows estimated direct and indirect job creation from phase three of UW-SLU. In addition, the table breaks down public and private sector costs per job.

**The public costs for the project are assuming \$50,000,000 is raised through private investors.*

The public-private partnership at UW-SLU has the ability to result in economic development throughout the region. “These projects represent an investment of \$360 million in new research facilities for the School of Medicine, which is making a significant contribution to the economic health of Seattle and the entire region,” commented John Finke, director for the National Development Council, while referring to all three phases of UW-SLU (University of Washington 2011). When the third phase of the project is completed there will be 847,000 square feet of research laboratory and accompanying office space (University of Washington 2011; National Development Council 2011).

A large project such as UW-SLU can contribute to regional economic growth that can lead to job creation. The economic impact from phase three of the project will include \$100 million expected in research grants (University of Washington 2011). In addition, the expansion into Seattle’s South Lake Union neighborhood has contributed to an influx of economic growth.

The developer for UW-SLU, Vulcan Real Estate, has helped create urban redevelopment of the South Lake Union neighborhood that rivals any urban redevelopment throughout the country. In 2011, Vulcan Real Estate also broke ground on office buildings for Amazon (Vulcan Real Estate 2011). By the time Amazon's move is complete, the company will occupy eleven buildings of over 2,000,000 square feet in Seattle's South Lake Union neighborhood (Pryne 2011). Although Amazon's move cannot be contributed to UW-SLU, UW-SLU has contributed to the up and coming South Lake Union neighborhood (Pryne 2007).

UW-SLU Conclusion

UW-SLU is an example of a public-private partnership that has been relatively efficient at creating jobs. The partnership allowed University of Washington's School of Medicine to improve its research capabilities to stay ahead in the medical industry by expanding quickly and creating state of the art research facilities. As a result, this led to more efficient job creation.

The public-private partnership at UW-SLU has stability. The sheer amount of capital invested in physical infrastructure has increased stability. In addition, the public funds invested represent the public's support of the project. Both stability and the public's will are important contributors that the public sector brings to the partnership. In addition, the substantial investment from the public sector contributes to attracting outside funding.

The public-private partnership was able to attract outside capital to support the project, which could increase its capacity. The amount of money invested has been substantial. This large investment of capital would not have been invested if the PPP did not have adequate capacity. UW-SLU has adequate capacity.

Collaboration between sectors is vital for public-private partnerships to be more efficient at creating jobs and at the construction stage of UW-SLU there was collaboration. A factor that should be noted when discussing the PPP at UW-SLU is the argument that this partnership is not truly a PPP. Those that define a PPP narrowly may say that there needs to be collaboration throughout the entire project. UW-SLU collaboration took place mainly during the construction stage and after the facilities were constructed the public sector has become really the only dominant player. The non-public contributions came during the construction stage. However, a broad definition of a PPP encompasses any outside investment in a public endeavor, and UW-SLU fits that definition of a PPP.

Chapter 6

Louisiana State University's Digital Media Center (LSU-DMC)

LSU-DMC Introduction

This chapter analyzes Louisiana State University's Digital Media Center (LSU-DMC) as a PPP model. The following research question is the primary focus of the thesis and therefore the analysis of the PPP is focused in that direction. Is there a specific public-private partnership model that can create jobs more efficiently than other models? The structural stability and social responsiveness of the public sector and increased capacity, represented by the creative entrepreneurial attitude and access to capital of the private sector, could provide an opportunity to create jobs more efficiently if the two sectors collaborate.

I chose LSU-DMC as a case because it provides a distinct public-private partnership model to examine where the public sector is investing all of the upfront costs for the facility. The arrangement at LSU-DMC is for the public sector to provide the upfront capital with the primary private sector partner agreeing to become a tenant of the building for at least six years. In this case the private sector has only committed to invest a minimal amount of capital for the project in comparison to the overall costs. The PPP's ability to create jobs more efficiently and to alleviate public sector costs is studied in this model.

This chapter highlights the public-private partnership at LSU-DMC and its job creation abilities. The chapter begins with the PPP's background and the arrangement between Louisiana State University and Electronic Arts Incorporated (EA). Then LSU-DMC is studied as a public-private partnership. Next, this PPP is analyzed in regards to its ability to create jobs more

efficiently. Eventually, the chapter concludes with some remarks about the characteristics necessary for more efficient job creation.

LSU-DMC Background

The purpose of LSU-DMC will be to, “.....enhance the presence of the digital media industry in Louisiana and increase the collaboration of private industry and public education” (Louisiana State University 2011a). The investment will promote the digital media industry in Louisiana by contributing to workforce training and economic development. The partnership will create an atmosphere where students and faculty will have the opportunity to interact with the private sector (Louisiana State University 2011c). The new facility at Louisiana State University will contribute to the state’s emerging identity as a hub for the digital media industry (Louisiana Economic Development 2011b).

The new facility will be a 94,000 square foot, three-story building on the main campus of the university. LSU’s Center for Computation and Technology will use 50,000 square feet of the building’s space, becoming the primary public sector tenant. EA will be the largest private sector tenant using 30,000 square feet of the building’s space. EA’s North American Test Center will move into the facility from LSU’s South Campus where it’s been located since 2008 (Louisiana Economic Development 2011b). EA is a world leader in interactive entertainment software known for Madden NFL, The Sims, and other popular software franchises (Electronic Arts Inc. 2012). In addition to the two primary tenants, LSU’s Arts, Visualization, Advanced Technologies and Research (AVATAR) Initiative will move into the building. This program is a multidisciplinary approach to arts, technology, and computer sciences and will fit well with the

new facility's objectives. The building will include classrooms with world class audio/visual capabilities (Louisiana State University 2011c).

The entire project will cost just over \$29 million, but the facility itself will cost closer to \$24 million to construct. Of the total project expenditures, nearly \$6 million will be used for mechanical plant upgrades and to relocate LSU's Sheep and Swine Exhibit (Louisiana Emerging Technology Center 2011). The \$29.3 million will be invested upfront by the public sector (Louisiana Economic Development 2011b). EA has agreed to a deal through June of 2018 that will pay \$465,000 annually in rent (Louisiana Emerging Technology Center 2011). For six years this would amount to \$2.79 million that would be invested by EA. This private capital investment is minimal when looking at the overall project costs.

LSU-DMC's Public-Private Partnership

The public-private partnership at LSU-DMC is primarily made up of Louisiana State University and Louisiana's Department of Economic Development on the public side and Electronic Arts on the private side. The relationship between the state of Louisiana and EA began in 2008, when EA located its North American Test Center at LSU. When EA made the move to Louisiana in 2008 they did so for a variety of reasons. First, EA wanted a talented labor pool and Louisiana's Department of Economic Development FastStart workforce development program would provide the training necessary. Second, the state of Louisiana was offering a 35% tax break to companies developing video game software in Louisiana. Third, there was an expectation that a new facility would be created at LSU (Louisiana Economic Development 2012). The relationship between EA and Louisiana has been positive, and as a result the expected building is now under construction.

The private sector entity of this partnership, EA, has committed to the Digital Media Center at LSU through June of 2018 (Louisiana State University 2011b). This six year deal represents a quandary when analyzing the public-private partnership's stability. Does a six year commitment represent stability? If EA packed up and left in June of 2018 the answer would be no. This would leave the public sector paying all but \$2.79 million of the \$29.3 million price tag for the Digital Media Center. As a result, this arrangement would leave the public sector paying over 90% of the project's costs. However, EA has exceeded relationship expectations up to this point. For example, when EA first located at LSU it was expecting to hire 20 full time employees and 200 part time employees, but it quickly hired 400 employees of which 200 were employed full time (Silicon Bayou 2011). At this point it is difficult to conclude whether this PPP has stability. Stability would increase at LSU's Digital Media Center with an increased commitment from EA. A longer commitment by EA would contribute to the private sector investing more capital, which is essential to alleviate the public sector's burden.

Capacity is important for a public-private partnership to create jobs more efficiently and at this time LSU-DMC has adequate capacity. The capacity of the PPP is shown by EA's six year commitment. EA would not have made a commitment to the PPP if it did not have adequate capacity.

The framework is in place for collaboration between the public and private sectors at LSU-DMC. This project will allow LSU faculty and students to work with one of the world's best digital media companies at world class facilities under one roof (Louisiana Economic Development 2011a). If the partners take advantage of this structure then collaboration can flourish and the PPP will have the opportunity to create jobs more efficiently.

LSU-DMC for Job Creation

The new Digital Media Center at LSU will create jobs. It is expected that the private sector tenant, EA, will create 200 new jobs at its North American Test Center within the next three or four years (Silicon Bayou 2011). However, the job creation effects of LSU-DMC will go beyond that. Building infrastructure creates temporary construction jobs (Fox and Porca 2001, 104). Indirect and induced jobs are also not added into the equation. In addition, it is difficult to speculate on how many future jobs will be created from the increase in human capital through innovative research that will occur at LSU-DMC between academia and the private sector. The evaluation of LSU-DMC as a relatively efficient job creation mechanism is difficult without knowing the exact number of construction, indirect, induced, and future jobs that will be created from the PPP.

There are multiple benefits that will come from the public-private partnership at LSU-DMC. First, it will directly create jobs. Second, it will help develop the region's economy. Third, it will contribute to the expanding academic programs in the field of digital media at the university. At the construction groundbreaking at LSU-DMC, Louisiana Governor Bobby Jindal commented in regards to part of the purpose of the facility, ".....to attract and create great high paying jobs right here in our state" (Louisiana Economic Development 2011a). LSU Chancellor Michael Martin has also recognized the opportunities available through the construction of the facility. "It's important from an economic development standpoint, and it's an important part of an academic area we plan to grow" (Louisiana State University 2011b).

Table 6.1 Financial contributions for LSU-DMC from various partners in millions of dollars.

Public Dollars Invested	Private Dollars Invested	Investor
26.3		State of Louisiana
3		U.S. Economic Development Administration Grant
	2.79*	EA Sports
29.3		Sector Totals (\$29.3 million)

Source: (Louisiana State University 2011b; Louisiana Economic Development 2011b)

Notes: This table shows where the investments in LSU-DMC originated.

**The \$2.79 million is based on annual rent from EA Sports of \$465,000 for the 6 year deal.*

The commitment that EA has made at LSU-DMC is of great importance when looking at the efficiency of job creation of the public-private partnership and how it relates to stability. EA made a commitment through June of 2018 (Louisiana State University 2011b). Therefore, if EA were to leave in June of 2018 then the PPP would be short lived and would not have stability. The private investment in the partnership would only amount to \$2.79 million. The six year commitment would in effect make the public sector cost per job \$132,550. However, if EA were to stay at the facility for an extended period of time then this would contribute to increased stability and would increase LSU-DMC's efficiency at creating jobs from the public sector's perspective. The longer EA stays, the more advantageous the partnership is for the public sector. The more rent that the private sector tenant pays creates less of a burden on tax payers.

Table 6.2 Job Creation at LSU-DMC.

	Number of Jobs Created	Public Costs + Private Costs Total Costs	Private Sector Cost Per Job	Public Sector Cost Per Job (Public Sector Efficiency)
Before private investment	200	\$29,300,000 \$ <u>0</u> \$29,300,000	\$0	\$146,500
After EA's six year commitment	200	\$26,510,000 \$ <u>2,790,000</u> \$29,300,000	\$13,950	\$132,550
If EA were to make a 36 year commitment*	200	\$12,560,000 \$ <u>16,740,000</u> \$29,300,000	\$83,700	\$62,800

Source: (Silicon Bayou 2011; Louisiana State University 2011b; Louisiana Economic Development 2011b)

Notes: This table shows public and private sector costs per job created before and after EA's annual rent.

** This hypothetical commitment highlights what it might take for LSU-DMC to be relatively efficient at creating jobs from the public sector's perspective.*

EA's commitment to LSU-DMC, albeit a short commitment, is evidence of the capacity of the public-private partnership. There would be no incentive for EA to join the partnership if they did not believe the arrangement had adequate capacity. EA would not have agreed to become a tenant at the facility in the first place if this was the case.

When it comes to collaboration and its effects on more efficient job creation only the future will hold the answer when evaluating LSU-DMC. Jobs will be created. EA has predicted that they will create 200 new jobs due to the move within three or four years (Silicon Bayou 2011). The facility is structured for collaboration between academia and the private sector. If collaboration is emphasized then the job creation benefits could increase.

LSU-DMC Conclusion

The public-private partnership created for LSU-DMC has an opportunity to create jobs more efficiently. Since the PPP's stability is in question, more time is necessary to evaluate the PPP as a relatively efficient job creation mechanism. The facility is expected to create economic development throughout the region and it will expand the academic programs at the university. Both of these goals are directed toward the expectation that the facility will become an innovative hub for the digital media industry. There is a strong vision for LSU-DMC, but the results will best be evaluated in the future.

LSU-DMC represents a distinct public-private partnership model. The public sector is providing all of the upfront costs for the facility. The majority of the investment is coming from the Louisiana Department of Economic Development. The private sector will contribute through renting part of the facility. EA has committed to be a tenant through June of 2018 amounting to a \$2.79 million investment. This investment will alleviate some of the public sector's burden, but the PPP's job creation efficiency will rely on whether EA decides to stay at the facility beyond the initial six year commitment.

Capacity and collaboration are present at LSU-DMC, but the stability of the public-private partnership is suspect. The PPP established has adequate capacity. This is shown by EA's willingness to commit six years at the facility. The PPP has the framework in place for extensive collaboration between the public and private sectors. World class facilities with academic research and private sector quality assurance under one roof will be a huge advantage in regards to job creation if the partners take advantage of the situation. However, only a six year commitment by the major private sector firm puts the stability of the PPP into question. If EA eventually agrees to extend its six year commitment as a tenant and if the partners emphasize

collaboration then this PPP model could be a more efficient job creator from the public sector's perspective.

In order for LSU-DMC to be regarded as a relatively efficient job creator, EA would need to make a longer commitment to stay at the new facility. A longer commitment by EA would contribute to the public sector getting a larger return on its investment. One of the strengths that the private sector brings to a public-private partnership is access to capital. More private investment would allow the jobs created at LSU-DMC to be less of a burden on taxpayers. LSU-DMC could create jobs more efficiently with additional private investment.

Chapter 7

Concluding Remarks

Comparing CU-ICAR, UW-SLU, and LSU-DMC for Job Creation Efficiency

Each of the public-private partnership cases presented in this thesis illustrates that a PPP's ability to create jobs more efficiently is dependent on the partnership's stability, capacity, and collaboration. The three PPPs each represent a distinct model and therefore the analysis and the conclusions that can be made from them have the ability to cover a fairly wide spectrum. This thesis primarily analyzed these PPPs for job creation.

The cases each represent a distinct public-private partnership model, which together represent a variety of PPP structures. CU-ICAR brought together investments from numerous private firms including American Titanium Works, AT&T, BMW, Michelin, Proterra, and Timken (Clemson University 2012d). UW-SLU brought in outside capital that was mostly from private philanthropic donors who were not investing as financial partners (University of Washington 2011). LSU-DMC relied on the public sector to take on the initial investment with the private sector investing in the future (Louisiana Emerging Technology Center 2011).

Even though all three of the public-private partnerships created jobs, the primary reasons for constructing the PPPs was not job creation. All three of the PPPs presented had similar missions in that they all wanted to be leaders in their respective industries. Job creation became a byproduct. This research and discussion confirms what the literature review supports in that PPPs that have stability, capacity, and collaboration can create jobs more efficiently. This is true whether or not their primary purpose was to create jobs. CU-ICAR's mission is to be the world's leader in automotive and motor sports education, research, and development (Clemson University 2010a). The mission for UW-SLU is to expand the university's medical research

capabilities to remain a leader in their industry (Gianopoulos and Morelli 2009). LSU-DMC was designed to contribute to the state's economic development and advance academic programs, both in the name of the digital media industry (Louisiana State University 2011b). All three of the PPPs would, in a sense, become a hub for innovation in their respective fields. Innovation can have a positive impact on economic development and job creation.

The public-private partnership models represented by CU-ICAR and UW-SLU were able to create jobs more efficiently than the other model represented by LSU-DMC. The analyses in chapters 4 and 5 provide evidence that CU-ICAR and UW-SLU have been relatively efficient at job creation. The public sector's cost per job at CU-ICAR after including announced jobs and estimated indirect jobs is \$22,874. The public sector's cost per job for the third stage of construction at UW-SLU, including indirect jobs, is \$23,000. Evidence from chapter 5 highlights the capacity of LSU-DMC, but stability and continued collaboration will be the determining factors in whether it can be more efficient at creating jobs. The public sector's cost per job at LSU-DMC after EA's six year commitment is \$132,550. It should be noted that this case does not include indirect job creation. However, if EA agrees to extend its stay this would effectively drop the public sector cost per job making this PPP more efficient at job creation from the public sector's perspective. These differing cases highlight the importance of a PPP's stability, capacity, and collaboration in order to create jobs more efficiently. Without the essential characteristics of stability, capacity, and collaboration then more efficient job creation becomes extremely difficult.

Table 7.1 Job Creation Efficiency at CU-ICAR, UW-SLU, and LSU-DMC.

	Number of Jobs Created	Public Costs + Private Costs Total Costs	Private Sector Cost Per Job	Public Sector Cost Per Job (Public Sector Efficiency)
CU-ICAR- Upfront investment by both public and private sectors for initial construction, with opportunities for future private investment				
Jobs already created	680	\$139,900,000 <u>\$ 93,500,000</u> \$233,400,000	\$137,500	\$205,735
Jobs created plus estimated indirect jobs	1,747*	\$139,900,000 <u>\$ 93,500,000</u> \$233,400,000	\$53,520	\$80,080
Announced jobs plus estimated indirect jobs	6,116*	\$139,900,000 <u>\$561,500,000</u> \$701,400,000	\$91,808	\$22,874
UW-SLU (Third Phase Only)- Upfront investment by both public and non-public sectors				
Estimated direct jobs created	2,000	\$115,000,000** <u>\$ 50,000,000</u> \$165,000,000	\$25,000	\$57,500
Estimated direct and indirect jobs created	5,000	\$115,000,000** <u>\$ 50,000,000</u> \$165,000,000	\$10,000	\$23,000
LSU-DMC- Upfront investment by the public sector, with an agreement that the private sector partner will invest after the initial construction				
Before private investment	200	\$29,300,000 <u>\$ 0</u> \$29,300,000	\$0	\$146,500
After EA's six year commitment	200	\$26,510,000*** <u>\$ 2,790,000</u> \$29,300,000	\$13,950	\$132,550***
If EA were to make a 36 year commitment***	200	\$12,560,000 <u>\$16,740,000</u> \$29,300,000	\$83,700	\$62,800

Source: (Clemson University 2012c; Battelle Technology Partnership Practice 2007; Mitchell, 2011; University of Washington 201; Silicon Bayou 2011; Louisiana State University 2011b; Louisiana Economic Development 2011b)

Notes: The table compares job creation at the three public-private partnerships analyzed.

*A multiplier of 2.57 jobs per employee is used based on the Battelle Study.

**The public costs for the project are assuming \$50,000,000 is raised through private investors.

***Public sector costs could decrease further if EA continues as a tenant past six years.

Research Question and Findings

This thesis focused on the following research question. Is there a specific public-private partnership model that can create jobs more efficiently than other models? The data collected allows for the three cases to be compared in order to determine whether one model can create jobs more efficiently than other models.

Each case represents a distinct organizational structure. CU-ICAR and UW-SLU created jobs more efficiently than LSU-DMC (Clemson University 2012c; University of Washington 2011). LSU-DMC will create jobs directly, but it remains to be seen how much of an impact the public-private partnership will have on indirect, induced, and future job growth (Silicon Bayou 2011). However, more importantly, the stability of LSU-DMC is in question. With only a six year commitment by the private sector, the costs for the jobs being created will fall heavily on the public sector. For this PPP and its organizational structure to create jobs as efficiently as the other two models then the private sector's commitment would need to be much longer. Even to get in the same public sector efficiency range with the PPPs with upfront non-public investment, the commitment would need to be in the neighborhood of six times what was agreed upon, which would represent a commitment of 36 years.

The models represented by CU-ICAR and UW-SLU are more efficient at creating jobs than the model represented by LSU-DMC. The upfront investment from private firms in the case of CU-ICAR and philanthropic donors in the case of UW-SLU alleviates some of the financial burden from the public sector, which leads to greater job creation efficiency from the public sector's perspective. The model represented by LSU-DMC could create jobs more efficiently if the private sector partner were to commit to a long term deal, which would add stability to the partnership. PPP models with substantial upfront investment from outside the public sector

appear to be a viable policy option for more efficient job creation. These models can create jobs more efficiently than models that rely on the public sector to provide the majority of the initial investment.

Stability is an essential characteristic for public-private partnerships to create jobs more efficiently. At CU-ICAR, both the private sector and the public sector were willing to invest a substantial amount of capital (Clemson University 2012c). Both sectors were willing to share risks and rewards, which in turn added stability to the PPP. UW-SLU also received a substantial amount of capital from both the public sector and from philanthropic donors, which led to increased stability (University of Washington 2011). The entire initial investment at LSU-DMC was from the public sector with the promise that EA, the private sector partner, would pay annual rent at the facility for six years (Louisiana Emerging Technology Center 2011). For this PPP to have stability, EA would need to stay at the facility for a longer period of time, which would result in more private capital being invested.

A second key characteristic for public-private partnerships to create jobs more efficiently is capacity. The private firms that invested in CU-ICAR would not have invested in the PPP if it did not have adequate capacity. BMW invested in cutting edge education, research, and development (BMW Manufacturing Co. 2012). BMW's investment at CU-ICAR contributes to increased capacity. UW-SLU created top notch facilities that were needed for education, research, and development. This was an investment that needed to be made for the university's medical program to expand and stay ahead in the medical industry. The public sector investments and the individual private donations highlight the capacity at UW-SLU (University of Washington 2012). LSU-DMC has capacity, which has been seen by the commitment of the primary private sector partner (Louisiana Emerging Technology Center 2011).

Finally, collaboration is essential for public-private partnerships to create jobs more efficiently. CU-ICAR has been a pillar of collaboration. Collaboration has occurred at the planning, construction, and implementation phases. The facilities were constructed with both public and private sectors in mind. The education, research, and development at the facility brought together professors and students with engineers for the purpose of innovation (Clemson University 2012b). Collaboration at UW-SLU took place mainly during the design and construction stages of the project (Gianopoulos and Morelli 2009). During this stage of the project collaboration was essential to getting the facility completed. When it comes to LSU-DMC, the framework is in place for future collaboration. The state of the art facility will allow researchers and students to work with a world class digital media company under one roof (Louisiana Economic Development 2011a).

The first two cases have already been relatively efficient at creating jobs while the third case has the opportunity to do so as well. Both CU-ICAR and UW-SLU created jobs more efficiently. By bringing in an entrepreneurial spirit and access to capital the partnerships were able to succeed. Both CU-ICAR and UW-SLU have stability, capacity, and collaboration. LSU-DMC has the ability to create jobs more efficiently if it can attract more private capital either through EA or another private firm. The data suggest that public-private partnerships for higher education infrastructure can create jobs more efficiently if they possess the essential characteristics of stability, capacity, and collaboration. The first two cases, CU-ICAR and UW-SLU, have these characteristics and have created jobs more efficiently than the third case, LSU-DMC. LSU-DMC has the capacity and the framework is there for collaboration, but stability will be the determining factor in whether the PPP can be a relatively efficient job creation mechanism.

The Oregon Sustainability Center (OSC)

An analysis of the proposed Oregon Sustainability Center (OSC) provides additional evidence of the importance of stability, capacity, and collaboration for public-private partnerships. This case highlights a fundamental flaw in the proposed PPP's structure, which was a lack of capacity. The project only attracted \$4.4 million of non-public capital. The result was that the public sector would have been required to contribute \$62.3 million to the construction of the facility (Oregon Sustainability Center 2011). The non-public sector contribution adds up to less than 7% of the total investment. The reason for this lack of investment is simple. The OSC was not presented as having adequate capacity. Without capacity; a PPP would not have stability and collaboration becomes a mute point.

The OSC was a proposed project that attempted to create a public-private partnership for the construction of one of the most sustainable large scale buildings in the world that would have net zero energy and net zero water (Oregon Sustainability Center 2009). The design included office space, retail space, conference rooms, classrooms, a visualization lab, exhibit hall, common space, and a basement that would contain a water tank, bike hub, and storage (Portland Development Commission 2009b). The idea was that it would become a hub for research in sustainability with university and private industry partnerships (Portland Development Commission 2009b).

The proposed project was envisioned as a public-private partnership between city, state, higher education, non-profit, and business partners (Portland Development Commission 2009b). Primary partners were the Oregon University System, Portland Development Commission, City of Portland, Portland Sustainability Institute, and the Oregon Living Building Initiative. Secondary partners included Portland Community College, the Oregon Built Environment and

Sustainable Technologies Center (BEST), the Oregon State Board of Higher Education, and a design team of over twenty Oregon based businesses including some that are national and international leaders in green development (Oregon Sustainability Center 2009a).

The design and plans were put in place for the OSC, but when the discussion shifted to funding, the arrangement fell through. There was not enough upfront private investment for the OSC. Private sector firms did not see the benefit in investing in the OSC. This left the project in disarray. In addition, the state of Oregon was not willing to take on the largest financial contribution. The Oregon Legislature in February of 2012 voted down funding that would make the state of Oregon the largest investor by providing \$37 million in bonds that would allow the project to move forward and the facility to be constructed (Slovic 2012). This budget gap was the sticking point (Esteve 2012). Private industries were not completely willing to invest in the construction of the building. There were commitments from private firms to become tenants after the building's construction, but there was not enough upfront private investment (Williams 2012). Without shared risk, the Oregon Legislature would not support the project (Slovic 2012). As a result of both the public and private sectors unwillingness to invest the necessary capital, the project failed.

Collaboration did occur during the innovative design phase of the project. The Portland Development Council, the Oregon University System, and private sector architectural, mechanical engineering, and other firms made the design phase successful. The concepts for a high rise building with net zero energy and net zero water were developed. The collaboration at the planning stage of the process was phenomenal (Portland Development Commission 2009a). However, this was as far as the collaboration went.

The OSC did not have stability or capacity, and other than the planning and design stage, there was no collaboration. Neither the public nor the private sector would commit a significant amount of capital toward the construction of the facility. The Oregon Legislature, representing the public's will, would not commit the public funds necessary for the project to move forward. This created a lack of stability, which affected the opportunity for private investment and the ability for the project to be implemented. Although the development team promised investment returns by private entities, there was still an unwillingness to invest. If private firms believed that it was worth the risk then there would have been more private capital invested. The lack of capacity hindered private investment. The collaboration necessary was not there. The Oregon University System and the Portland Development Council were not supported by the Oregon Legislature. There was a lack of collaboration amongst the public sector as well as the private sector. This was shown by a lack of private capital invested. There were some private entities willing to commit to become building tenants, but the private sector was unwilling to collaborate in the funding for the construction of the building.

The Opportunity for Job Creation from Higher Education Infrastructure

The various cases highlight the opportunities available for job creation through public-private partnerships for higher education infrastructure. As witnessed with UW-SLU, investing in higher education infrastructure creates an opportunity for job growth in numerous ways. First, constructing infrastructure in general can create jobs. These jobs can be created almost immediately, but they are temporary (Fox and Porca 2001, 104). Second, higher education infrastructure has the ability to create jobs through the education, research, and development that is occurring at the facilities that have been constructed (Chatterton and Goddard 2000, 475).

Third, indirect and induced jobs can be created from the increase in economic activity that these facilities provide (University of Washington 2011). Investing in higher education infrastructure can generate job growth and if the private sector can be brought in as part of a PPP then the public sector's cost per job can decrease.

The three cases presented are only the beginning when it comes to investment in higher education infrastructure. Numerous other projects have created jobs and other opportunities are still out there to create jobs. Further research could address opportunities for higher education infrastructure investment.

The Opportunity for Job Creation from Public-Private Partnerships

Stability, capacity, and collaboration are essential characteristics that impact a public-private partnership's job creation efficiency. If PPPs can be arranged that include these characteristics then they should be analyzed further as a viable policy option for job creation. This thesis argues that stability, capacity, and collaboration are essential for PPPs to create jobs more efficiently. This conclusion is supported by the three cases presented.

The three cases analyzed higher education infrastructure, but there could be other opportunities for public-private partnerships to create jobs in other industries. Transportation and health care are examples of industries where PPPs could be used to create jobs. The job creation outcomes for these industries could be similar to the job creation outcomes for higher education infrastructure. Transportation and health care infrastructure can be created using a PPP model that could contribute to more efficient job growth in the future. Also, as witnessed with Proterra and American Titanium Works at CU-ICAR, much of this job growth can come from the private sector making job creation more efficient from the public sector's perspective

(Arend 2010; Mitchell 2011). Further studies could analyze the necessity of stability, capacity, and collaboration in PPPs in other industries.

Despite the idea that stability, capacity, and collaboration are necessary for public-private partnerships to create jobs more efficiently, these characteristics do not guarantee success for PPPs. This thesis provides a focused analysis of three higher education infrastructure PPPs, but the conclusions could be broadened to address PPPs in other industries. That is not to say that success as a relatively efficient job creation mechanism is guaranteed for higher education infrastructure PPPs that have stability, capacity, and collaboration. The point is that it would be very difficult if not impossible for a PPP for higher education infrastructure to create jobs more efficiently without those characteristics.

Limitations

This research is limited by its scope. Only three public-private partnership models were analyzed for their relative job creation efficiency. Therefore, the evidence only supports which of the three PPP models can create jobs more efficiently from the public sector's perspective. In addition, these PPP models are all focused on higher education infrastructure. However, this limitation could provide an opportunity for future research that analyzes more PPP models or even PPPs in other industries.

This research is also limited by the data gap. For example, indirect jobs are included in the calculations for CU-ICAR and UW-SLU, but not for LSU-DMC because of the lack of available data. CU-ICAR indirect jobs are estimated using the Bureau of Economic Analysis Direct-Effect Employment Multiplier for research parks, UW-SLU indirect job claims come from the University of Washington, and LSU-DMC data for indirect job creation is not readily

available. More data need to be available in regards to public-private partnerships' job creation abilities. This thesis creates a framework for analyzing PPP models and their job creation efficiency. However, this thesis is limited by the amount of data available. More readily available data would contribute to policy makers having a better understanding of what opportunities PPPs can provide for job creation.

Another limitation is that each public-private partnership's characteristics are not measured by their intensity, but only whether they are present or not in the arrangements. It could be assumed that more stability, more capacity, and/or more collaboration could lead to more efficient job creation, but the research design does not account for this. This could provide the foundation for further research.

Public-private partnerships that have stability, capacity, and collaboration appear to create jobs more efficiently than PPPs that do not include these characteristics. This phenomenon could be the basis for further research. Further research could also expand into other industries. The benefits of this research could lead to policy makers recognizing the benefits of solid structured PPPs for more efficient job creation and as a result they could be considered as viable policy options for future job growth.

Implications

An initial investment by the public sector, partnering with the private sector, could create the environment and infrastructure necessary for further private sector investment. The private sector will invest in job creation if it helps its bottom line. The public sector has the opportunity to create the infrastructure and environment necessary for private investment. This opportunity can create jobs with non-public sector partners contributing a substantial amount of capital

upfront. Policy makers could expand the opportunity for solid structured PPPs for the purpose of creating jobs more efficiently. More private sector, or at least non-public sector, investment in these PPPs could help alleviate the burden placed on the public sector.

This thesis evaluates which type of public-private partnership model can create jobs more efficiently. There is an opportunity for PPPs with stability, capacity, and collaboration to create jobs more efficiently. This research – and other similar analyses – may be able to contribute to informed policy decisions that further government’s goal of more efficient job creation.

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