

NAVIGATING THE PARTNER LANDSCAPE - UNDERSTANDING THE IMPACT OF  
EXTERNAL RESOURCES AND PARTNERS ON UNIVERSITIES  
IN THE MODERN ECONOMY

by

Jessica Shepard Watts



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by

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Jessica Shepard Watts, PhD  
The University of Texas at Dallas, 2019

Supervising Professor: James R. Harrington, PhD

Earning an education is a life-altering experience on an individual and societal basis. Beyond individual impact, academic institutions contribute to a constructive community through expertise and energy in the form of talented students and faculty. Outside of the classroom, university research and development activities have been proven to increase metropolitan areas' local human capital stock and further benefit the local economy through knowledge spillover. As both the importance and cost of higher education simultaneously increase, it is important to understand financial viability and the impact external partners have at HEIs. Faced with the demand to provide more services with less public funding, HEIs are relying on increased funding from alternative sources. Corporations are a unique revenue source to HEIs since the future success of their business is dependent on the production of educated graduates and innovations. As companies become more strategic with their time, talent, and money spent at HEIs, it is crucial to understand the determinants of how and why they decide to partner with universities. This dissertation examines university-industry engagement through three studies. The first study

expands on existing state funding research by analyzing budget revenue diversification of public universities in the state of Texas and the university response of development office budgets. Two additional studies explore the relationship between companies and HEIs, from both the industry and academic perspective. While scholars have examined corporate philanthropy, literature has not fully explored corporate engagement at HEIs. A holistic collaboration includes corporate philanthropy, knowledge transfer, research collaborations, and student recruitment, among other activities. A second study analyzes determinants of HEI engagement and partnership satisfaction through an industry lens. The third study analyzes engagement through an academic lens, exploring the impact of selected organizational factors on the success of university-industry partnerships. Understanding the perspectives of both sides of the university-industry partnership in one comprehensive study is distinctive. The results will be informative to both scholars and practitioners.

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# **CHAPTER 1**

## **INTRODUCTION**

Education is a life-altering experience on an individual and societal basis. Earning a college degree is an opportunity for one to rise above the socio-economic situation in which they were born. Beyond individual impact, academic institutions contribute to a constructive community through expertise and energy in the form of talented students and faculty. Outside of the classroom, university research and development activities have been proven to increase metropolitan areas' local human capital stock and further benefit the local economy through knowledge spillover (Abel and Deitz, 2011). As both the importance and cost of higher education simultaneously increase, it is important to understand financial viability and the impact external partners have at higher education institutions (HEIs).

Economic conditions of public HEIs are uneven and deteriorating, mainly due to the degree that public universities are historically reliant on government and tax generated revenue (Johnstone, 2002). With decreasing state funding, increases in demand, increases in enrollment and tuition increase limits, the financial future of public higher education looks bleak. Faced with the demand to provide more services with less public funding, HEIs are relying on increased funding from alternative sources such as alumni, foundations, and corporations. These alternate funding sources are an opportunity to fill the funding gap and maintain and possibly expand university operations.

Corporations are a unique revenue source to HEIs since the future success of their business is dependent on the production of educated graduates and innovations. Companies have always hired employees from universities, but growing demand has increased the value and

scarcity of the resource of top talent. As companies become more strategic with their time, talent, and money spent at HEIs, it is crucial to understand the determinants of university-industry engagement, including how and why they decide to partner with universities.

This dissertation examines university-industry engagement through three studies. Literature has established the impact of decreased state funding on HEIs and studied university responses. Universities have attempted to counter reduced state funding by increasing research revenue (Slaughter & Leslie 1997; Slaughter & Rhoades 2004) and increasing out of state enrollment (Jaquette & Curs, 2015), among other efforts. The first study in the dissertation, in Chapter 2, will expand on existing state funding and revenue diversification research. Chapter 2 studies if revenue is diversifying and as it does, analyzing the shift of funding towards gift and grant sources. A second analysis examines the possible university response of increasing or decreasing development office budgets. Texas has the second-largest student enrollment at HEIs after California. The expansive higher education network in Texas provides a large sample of institutions for the study.

Two additional studies in Chapter 3 and Chapter 4 will explore the relationship between companies and HEIs, from both the industry and academic perspective. While scholars have examined corporate philanthropy, it remains a fascinating phenomenon which is yet to be sufficiently understood (Gautier & Pache, 2015).

Corporate philanthropy literature has not fully explored engagement at HEIs. Research has focused on key features of corporate philanthropy, including the drivers, the essence, the outcomes, and organization of activity. Scholarly work on industry and university engagement have primarily focused on knowledge transfer and research relationships (Etzkowitz, 2003;

Dooley & Kirk, 2007; Mintrom, 2008; Galán-Muros & Plewa, 2016). Chapter 3 and Chapter 4 are distinct as they provide the perspectives from both sides of the industry and university comprehensive partnership. A holistic collaboration includes corporate philanthropy, knowledge transfer, research collaborations, and student recruitment, among other activities.

In Chapter 3, a second study analyzes determinants of HEI engagement and partnership satisfaction through an industry lens. Industry respondents shared their insight on partnerships, including company goals for university engagement and criteria used to select academic partners. These engagement factors, combined with three other select criteria, are compared to the satisfaction levels of industry partners. The results will be informative to both scholars and practitioners. The third study in Chapter 4 analyzes university-industry engagement through an academic lens. Chapter 4 explores the impact that leadership, open communication, conflict, trust, and commitment have on the success of university-industry partnerships. These identified organizational factors are critical to the university-industry collaboration process. These elements are cross analyzed with industry partner success, measured through corporate giving to the university. Understanding the perspectives of both sides of the university-industry partnership in one comprehensive study is distinctive.

### **Importance of Higher Education Institutions and Research**

Education and the success of the economy, at all levels, are interdependent. Colleges and universities play an integral role in the success of our country and world through the students they educate and the innovation they foster. A good college education is a catalyst to opportunity and a requirement for upcoming generations to persevere and flourish in the twenty-first century (Liu, 2011). Universities are engines of innovation and economic opportunity that fuel the

academic process. The result of innovation on campus and a focus on the future is the fostering of entrepreneurial leaders (Birx, Anderson-Fletcher, & Whitney, 2013).

Academic institutions contribute to a constructive community through expertise and energy they offer in the form of talented students and faculty. It is essential to understand the landscape and impact of the American higher education system. Over 4,500 2-year and 4-year institutions in the U.S. educate the population. In fall 2019, about 19.9 million students entered American colleges and universities. About 6 million students attend 2-year institutions, and nearly 13.9 million attend 4-year institutions, with 16.9 million students enrolled in undergraduate programs and 3 million enrolled in post-baccalaureate programs (U.S. Department of Education National Center for Education Statistics, 2019). Although student success and disciplines vary, the university system is central to developing talent to fuel the economy as employer expectations of graduates continue to increase. Regardless of the discipline, employers expect graduates to have the experience and skillsets to function on the cutting edge of technology (Birx et al., 2013). High levels of human capital are crucial to the success of an economy. Economic growth and productivity are influenced by human capital, investment in research and development (R & D), and the development of knowledge and innovation. Beyond the classroom, R & D activities have been proven to increase metropolitan areas' local human capital stock and further benefit the local economy through knowledge spillover (Abel and Deitz, 2011).

The multiple functions of universities as a creator of knowledge, talent producer, and employer lead institutions to contribute to the socio-economic development in the areas where they are located. Universities make a significant local economic impact through investments in

the spending on services and goods, as well as salaries paid to employees (Pastor, Pérez and de Guevara, 2010). Universities also improve the local economy through partnerships with cities and states on research-based and community-based initiatives (Zumeta, 2011). American universities serve as a collaboration site for the “triple helix” of university-industry-government relations, a term coined by Etzkowitz and proven to be an effective method to leverage investments in research (Etzkowitz, 2003). As Mintrom describes, the “advancement of knowledge comes through research-based acts of discovery” and “through research that universities add to the shared stock of human knowledge” (Mintrom, 2008). University research has a local, national, and global impact. The need for direct awards to higher education institutions for collaborative transnational initiatives has been proven, with such support empowering universities to address sustainable development challenges of the twenty-first century (Koehn, 2012).

The unique culture at universities creates an environment conducive to fostering the innovation and discoveries the world demands. Research institutions serve as economic engines, attracting venture capital investment that creates business opportunities and jobs. As research intensity grows at colleges, the changing nature of faculty has been documented. There is increased pressure for faculty at major research universities to specialize in research and generate external research funding (Ehrenberg, 2012). Data analyzed between 1987 - 2008 showed that universities are hiring more adjunct and non-tenured track faculty to teach courses. This trend may occur for a variety of reasons, but one assumption is to allow the tenured and tenure-track faculty more time for research (Ehrenberg, 2012). Research faculty need the time to devote to exploring and developing ideas and products. As universities shift their faculty resources toward

research and innovation, the desire for recognition of the efforts and additional funding also increases.

Research continually impacts the world through new and innovative products. University research has an impact on their local economies and potentially the world. One of the most well-known and celebrated results of university research is the creation of the sports drink Gatorade. In 1965, the University of Florida assistant football coach Dwayne Douglas questioned colleague Robert Cade, a kidney disease specialist, about the excessive amount of weight his players lost during a football game. Players lost as much as 18 pounds during a game, without using the restroom (Kays and Phillips, 2003). Research ensued, with Cade deducing that players were sweating out electrolytes which affected the body's delicate chemical balance. Cade used the University of Florida freshman football players as test subjects to confirm his findings, which led to the creation of the drink that would become Gatorade (Kays and Phillips, 2003). Gatorade and the sports drink industry may not exist if Cade did not have the time and ability to answer Coach Douglas' question.

While success stories like Gatorade are outnumbered by patents sitting on a shelf, other technologies developed at universities have transformed our everyday lives such as multi-touch technology, search engine Google and medical advances with influenza (flu) vaccinations. The smartphone would not exist without multi-touch technology; a functionality developed by Wayne Westerman and John Elias University of Delaware (AAU, 2014). Westerman and Elias founded FingerWorks, a touch screen manufacturing company. Their company was later acquired by Apple Inc., and its technology is now in the hands of millions of consumers. Search engine Google is a product of a digital libraries research grant from the National Science

Foundation that supported Stanford University students, Larry Page and Sergey Brin. Page and Brin developed a prototype search engine that depended on their innovative PageRank Method that calculated results based on linkages by previous users from each page to other pages. PageRank is still an integral part of their finished product, Google, which is used for over 3.5 billion searches per day (AAU, 2014). The National Institute of Health (NIH) financially supports numerous medical researchers and universities. The flu is a significant threat to public health, affecting 20% of the U.S. population and killing about 36,000 annually. Medical research supported by the NIH has led to new diagnostics technologies and the nasal spray flu vaccine that was developed by researchers at the University of Michigan. NIH funded researchers are now close to a universal flu vaccine that could eliminate the need for annual flu shots (AAU, 2014). These discoveries are great examples of how university research generates the knowledge and talent that changes the world. The fast-paced world leads to the anticipation of the next groundbreaking technology, and universities have the unique culture to cultivate creative, intelligent minds and foster innovation. “The American research university is the key to a sustainable national climate of innovation that will attract new industries and create new jobs, supply quality education to its citizens, attract top international talent, and lead the international community in the research and development necessary to address issues of global importance,” (Birx et al., 2013).

Increasing research activity is a primary goal of American universities, with the two primary revenue streams coming from the federal government and private support from industry. Both total research and federal research funding levels are increasing, with slight dips due to the 2008 recession, although concerns around funding grow as federal research budgets continue to

contract. Total research funding includes federal research and additional funding from private sources, including industry, foundations, and individuals.

Since the 1950's the federal government has been the majority funder of university R & D activities, reaching as high as 73 percent in the 1960s. In 2018, the federal share of university R & D hovered around 55 percent. Industry's share of university R & D has increased from less than 3 percent in the 1960's to about 6 percent today (National Science Foundation, 2019). HEI's are absorbing a more significant share of their R & D costs, from paying for about 10 percent in the 1960s to over 25 percent today. Other funding sources include nonprofit organizations (7%), state and local governments (6 percent), and other sources (1 percent) (National Science Foundation, 2019). In 2017, at least \$150,000 in research expenditures was reported by 903 degree-granting institutions and 644 HEI reported at least \$1 million in R & D work.

With demand for research funding far exceeding the supply, universities are in extreme competition with each other for both federal support and corporate support.

### **Research Institution Accolades**

The wide-ranging goals of higher education lead to difficulty in quantifying the value-add of higher education in one measure. There are two highly respected distinctions in university research: The Carnegie Classification of Institutions of Higher Education (Carnegie Classification) and membership in the Association of American Universities (AAU). Understanding the Carnegie Classification and membership in AAU is essential for the context of this study, as external partners and funders play a significant role in helping universities earn such distinctions.

Membership in the AAU is highly sought after, and becoming a member is often a priority for non-member universities. According to the AAU website, the organization was founded in 1900 at a conference attended by 14 of the nation's leading Doctor of Philosophy (Ph. D) granting institutions. The organization was created in response to the rapidly changing academic ecosystem in the United States (U.S.). At the time, American institutions were garnering little respect from major European universities. The newly formed AAU sought to raise academic standards, bring greater uniformity to American universities, and raise the opinion entertained abroad of Ph. D's earned in the U.S. Membership in AAU is by invitation only and based on several criteria. Universities must demonstrate high-quality programs in academic research and scholarship in undergraduate programs, graduate programs, and professional education in several fields. Criteria also include the intangible benchmark that a university is outstanding because of the excellence of its research and education programs. These criteria are measured through research expenditures normalized by the number of faculty, scholarly citations, National Academy members, faculty honors, and the National Research Council faculty quality indicators. A membership committee of AAU presidents and chancellors reviews universities for AAU membership and institutions recommended for membership must be approved by a three-fourths vote of the membership (AAU, 2014).

One of the most respected university rankings is the Carnegie Classification. The Carnegie Classification has been the leading framework for recognizing and describing HEI's since the first publication in 1973 (The Carnegie Classification of Institutions of Higher Education, 2019). The rankings are derived from empirical data on colleges and universities. The published rankings initially were updated every 5-11 years, and in the last decade have been

updated every three years reflect changes among universities. The Carnegie Classification framework is widely used as a threshold of prestige and as a way to represent and control for institutional differences in the study of higher education. The public can look up specific institutions or create customized lists.

The Carnegie Classification includes listings in the following seven categories: Basic Classification, Undergraduate Instructional Program, Graduate Instructional Program, Enrollment Profile, Undergraduate Profile, Size and Setting, and Community Engagement. Altogether, 132 listings were published in 2018. The category of most interest to this dissertation is the Basic Classification, which categorizes institutions based on institutional attributes and behavior at a time-specific snapshot. The Basic Classification includes the following academic institution listings: Doctoral Universities, Master's Colleges & Universities, Baccalaureate Colleges, Associate's Colleges, Special Focus Two-Year, and Tribal Colleges. The HEIs with the most research activity are included in the listing titled Doctoral Universities: Very High Research Activity. HEIs in the list of Doctoral Universities: Very High Research Activity are considered R1 universities.

The level of research activity is calculated using measures of research activity including R&D expenditures in science and engineering and non- science and engineering fields, science and engineering research staff, and doctoral conferrals in multiple fields (Indiana University Center for Postsecondary Research, 2015). According to the Indiana University Center for Postsecondary Research, these data are statistically combined using principal components analysis to create two indices of research activity reflecting the total variation across these measures.

The path to achieving R1 status varies by university leadership, size, status, enrollment, and type. Institutional commitment across campus is required to meaningfully increase research activity, doctoral graduates, and other research measures. External partners can have a significant impact on funding to support these efforts. Increased revenue from government, corporations, foundations, and other private revenue streams can significantly increase the support for faculty start-up packages, doctoral fellowships, research centers, and faculty project. University external relations staff, including corporate relations officers, actively engage stakeholders around research enhancing activities that impact an institution's R1 status.

While rising in the rankings is a priority at every institution, entering the top 25 is near impossible. According to U.S. News & World Report rankings, only 35 universities have been ranked in the top 25 between the first publication in 1983 and 2015 (U.S. News National University Rankings, 2019). The top 20 academic institutions have not changed in the same timeframe. Regardless, achieving R1 status and rising in the rankings continues to be an aspiration for universities. The value of research universities and corresponding rankings is a fundamental tenet of this dissertation and the variables used in multiple analyses.

### **Philanthropy & Higher Education**

Philanthropy plays a significant role in American society, with origins dating back to the 17<sup>th</sup> century. Individuals, as opposed to companies, were primarily the donors to nonprofit and community organizations. In 2018, American individuals, bequests, foundations, and corporations donated \$427.71 billion to over 1 million charities (Giving USA, 2019). The total giving in 2018 was the highest reported total in the 60-year history of the Giving USA report, surpassing the 2017 giving total by 0.7%. The largest source of giving is individuals (68%),

followed by foundations (18%), bequests (9%) and corporations (5%). The order of the largest sources of giving has not changed since 2014, but the percentages and total giving amounts have changed (Figure 1). There are nine main categories of organizations receiving charitable support. Of the main categories, religion and education receive the most substantial proportion of support. Religion received \$124.52 billion (29.1%), and \$58.72 billion (13.7%) was invested in education (Giving USA, 2019).



Figure 1: Charitable Giving in the United States (Giving USA 2019, Giving USA 2015)

Philanthropic support of colleges and universities has been invaluable to the growth and progress of institutions across the country. According to the Voluntary Support of Education<sup>1</sup> (VSE) survey conducted by The Council for Advancement and Support of Education (CASE), charitable support of HEIs reached a record high of \$46.73 billion in 2018. The 2018 total represents an increase of 7.2 percent over the 2017 total of \$43.60 billion. In 2018, seven HEIs reported receiving gifts over \$100 million. The largest source of giving to HEIs is foundations (30.0%), followed by alumni (26.0%), non-alumni individuals (18.3%), corporations (14.4%) and other organizations (11.3%) (Figure 2).

	2017		2018		Percentage Change 2017 to 2018	
	Amount Raised	Percentage of Total	Amount Raised	Percentage of Total	Current \$	Adj. for Inflation
<b>Total Voluntary Support</b>	<b>\$43,600</b>	<b>100</b>	<b>\$46,730</b>	<b>100</b>	<b>7.2</b>	<b>4.6</b>
<b>Source</b>						
Alumni	\$11,370	26.1	\$12,154	26	6.9	4.3
Nonalumni Individuals	7,860	18	8,567	18.3	9	6.3
Corporations	6,600	15.1	6,732	14.4	2	-0.5
Foundations	13,130	30.1	14,010	30	6.7	4.1
Other Organizations	4,640	10.6	5,266	11.3	13.5	10.7
<b>Purpose</b>						
Current Operations	\$25,800	59.2	\$27,400	58.6	6.2	3.6
Capital Purposes	17,800	40.8	19,330	41.4	8.6	5.9

Figure 2: Estimated Voluntary Support of Higher Education by Source and Purpose, 2017 and 2018 (Dollars in Millions)  
(Council for Advancement and Support of Education [CASE], 2019)

<sup>1</sup> The Voluntary Support of Education (VSE) survey serves as the authoritative source of giving data and trends to HEIs in the U.S. The VSE has been collecting information for 50 years via an annual survey on giving data. In 2018, 929 HEIs responded to the survey, of which 871 institutions responded for two consecutive years. The Council for Advancement and Support of Education (CASE) acquired VSE in 2018.

One of the largest sources of private funds for HEIs and the subject of the majority of HEI fundraising research is university alumni. University alumni are individuals who attended and graduated from an institution of higher education. While some individuals support universities they did not attend, the majority of alumni support is invested in one's alma mater. The tradition of alumni giving back to their alma mater has evolved into a multi-billion dollar affair in the United States. Universities depend on alumni giving to support scholarship, student programs, faculty, and research. Without this source of support, institutions would not be able to function as they currently do.

Engaging alumni as donors is easier at some schools than others. Although the total amount of alumni support has increased, the average alumni giving percentage has decreased. In 2018, total giving from university alumni exceeded \$12.15 billion, but the alumni giving percentage continues to decrease. The alumni giving percentage has consistently decreased: 13.8% in 2001, 8.3% in 2014 and 7.5% in 2018, (CASE, 2019; Kaplan, 2015). One reason for the decrease is the total number of alumni continues to increase every year, leading to a larger denominator to calculate alumni giving percentage.

Numerous studies have researched the predictors of alumni engagement after graduation. Existing research has shown the profound impact that the college student experience has on an individual's level of engagement as an alumnus. Feldman and Newcomb (1994) reviewed and analyzed over 1,500 studies about the impact that college has on students. The findings summarize the attitudes and characteristics of American college students before college, during their studies, and after graduation. A range of variables was studied such as degree, choice of major, age, entrance method, and first impression of the campus environment. The synthesis

supports the assumption that a multifaceted collection of influences, beginning with the initial interaction on campus, shapes a student's perception of their university. The student's perceptions influence their attitudes and behavior throughout the lifecycle of the student-alumni-university relationship (Feldman and Newcomb, 1994).

Additional studies have supported the positive correlation between student experience and alumni engagement. Student engagement is a significant predictor of alumni engagement and volunteering through alumni associations (Weerts and Ronca, 2007). In another study, the impact of the college experience was substantial when compared to other variables including, financial aid, socio-demographic, post-college environment, and charitable behavior. The college experience variable had the most significant and consistent effects on the probability of future alumni giving (Marr, Mullin, & Siegfried, 2005). To capitalize on student experience and begin cultivating alumni relationships, Pumerantz (2005) suggests students be considered "alumni-in-training." Analyzing data from 83 universities, Pumerantz found that the students' experience was the most important theme that emerged. Creating an environment that provides positive student experience will increase the probability that students will become engaged alumni.

Happy students will become happy alumni and in turn, give back to their alma maters (Pumerantz, 2005). The once widely used engagement approach of student phonathon programs can still be useful in recruiting donors. A review of 20,000 student phonathon gifts identified critical predictors of pledge fulfillment and gift amount. The study found phonathons have the greatest success with alumni who are male, white, and earned a graduate degree (Watts, 2016).

Existing research has studied several key motivating factors of alumni donors. Levels of contributions tend to increase with age and the years since graduation (Bristol, 1990). The

probability of alumni giving and amount contributed also rises with an individual's income (Okunade & Berl, 1997). Other studies have shown the importance of involvement with fraternities during college studies (Harrison, Mitchell, & Peterson, 1995). Legacy alumni relationships and family ties to an institution have also been shown to increase alumni giving (Okunade & Berl, 1997). Alumni role identity (McDearmon, 2012) and the level of alumni satisfaction with their alma mater (Clotfelter, 2003) are also positively correlated to increased alumni giving.

Individual donors continue to be the majority funder of private sources to HEIs, providing 44 percent of funding between alumni (26.0%) and non-alumni individuals (18.3%) (CASE, 2019). In addition to making gifts, these individuals with an affinity for a university often contribute to other collaborations. For example, an individual supporter of a HEI may also serve on a foundation board of directors and have the opportunity to share grant proposals with the institution. Similarly, an alumnus who is also a Chief Executive Officer (CEO) of a company can encourage corporate support of their university. Regardless of the source, universities strive for increased private support. In the last decade, HEIs have placed greater emphasis on corporate funding and engagement. University-industry engagement remains a phenomenon yet to be fully understood.

### **Corporate Philanthropy**

Corporations are an important contributor in present-day philanthropy; however, before the 1950s, legal restrictions and unwritten rules limited corporations from engaging in social affairs (Smith, 1994). A ruling in a 1954 case involving the Smith Manufacturing Company Case removed the legal restrictions. The case involved a suit brought on the company by stockholders

for a corporate gift made to Princeton University. In the ruling, the Supreme Court established the "business judgment rule," allowing corporate managers to make contributions that in their judgment, promote the corporation's interest (Stendardi, 1992). As a result of the establishment of the "business judgment rule," debate over the legitimacy of the relationship between philanthropy and corporate activity.

A traditional view of business is grounded on a company's chief responsibility to increase its shareholders' wealth. If the corporation's philanthropy decreases profits, it can be viewed as spending the shareholders' money. Conversely, if philanthropic activity increases the prices of the corporation's services or products, then the manager is spending the consumer's money (Stendardi, 1992). Pressure on corporations to demonstrate their social responsibility challenged this traditional view. There is a general belief that companies should invest in the community in which they operate a business. Successful organizations must maintain good relationships with all key stakeholders, including groups beyond shareholders like customers, employers, and the community.

Existing literature defines corporate philanthropy in multiple ways. According to Johnson (1966), corporate contributions are the dollar value of donations deducted in a corporation's income tax return. Corporate philanthropy is a charitable transfer of corporate resources to recipients at below-market prices (Fry, Keim, & Meiners, 1987), but also contradicts the profit-making purpose of a company. This enigma creates academic discourse on whether corporate philanthropy is altruistic or for-profit (Fry et al., 1982). Corporate philanthropy is a response to the expectation to be good corporate citizens and has been found to benefit shareholders

(Godfrey, 2005). This study utilizes Gautier & Pache's (2015) definition of corporate philanthropy, as voluntary donations of corporate resources to charitable causes.

The perspective of corporate philanthropy transformed from the traditional view to enlightened self-interest in the 1980s. Enlightened self-interest is the belief that organizations will ultimately benefit from their investments in the community in the long run (Baumol 1970; Davis 1973; Galaskiewicz, 2016). The benefit may result in motivating future employees to work at the company or influencing a customer's decision to buy the company's product. Other fundamental premises are that a healthy company cannot thrive in a struggling community and that anticipated benefits were neither immediate, particular or quantifiable (Ricks Jr. and Williams, 2005). According to Smith (1994), the AT&T Foundation was one of the first to articulate that their philanthropic investments should not be 'a thing apart' from business. In the 1980s, Reynold Levy, as the head of the new AT&T Foundation, declared that philanthropic initiatives should help advance the interest of the business through intentional associations with government affairs, R & D, and marketing functions (Smith, 1994). The AT&T Foundation has benefitted the company's reputation as promoting AT&T as a company that cares about the community.

The positive influence of the company's reputation certainly impacts company performance. Until the 1989 Exxon Mobil Valdez oil spill, the Exxon Education Foundation funded programs with no relation to the company's central line of business. The oil spill exposed the shortcoming of the foundation operating in an insular manner, with no investments made in environmental groups that often criticized the company (Smith, 1994). The separation of company and foundation operations was a misstep for Exxon. The result was a disconnect from

the environmental community, and the company had to adopt a reactive posture toward environmentalists after the oil spill. Today, organizations seek to move beyond enlightened self-interest through attempts to connect their philanthropy to corporate strategy (Porter and Kramer, 2002).

The role of philanthropy as a part of corporate strategy continues to evolve. Although companies approach their charitable work in a variety of ways, the majority agree on the overall strategic importance of the activities. This new perception of corporate philanthropy led to a shift of beliefs, from enlightened self-interest to a similar but more strategic form of philanthropy intended to produce clear and measurable benefit within a specific time frame (Stendardi, 1992). Strategic corporate philanthropy connects the charitable activities of a company to business-related objectives. This approach involves companies making philanthropic decisions about financial gifts or employee volunteer hours, intending to reach a marketing or other business-related objective (Ricks, 2002). Numerous objectives can be achieved through this strategic approach to corporate philanthropy, such as increasing sales, facilitating market entry, or enhancing the corporate image (Varadarajan and Menon, 1988).

Corporate philanthropy became a consistent topic in academic literature, steadily exceeding ten academic publications a year, in the 1980s. Articles are scattered throughout multiple disciplines such as management, economics, public policy, and sociology journals, suggesting corporate philanthropy is a broad and multifaceted phenomenon (Gautier & Pache, 2015). The majority of the literature concentrates on the canons of corporate philanthropy, how activities are organized, primary drivers of corporate philanthropy, and on outcomes.

The literature on the tenets of corporate philanthropy has explored the altruistic versus profit-oriented continuum of corporate philanthropy. The spectrum ranges from corporate philanthropy as a commitment to the common good, to a community-oriented investment that fosters the business environment to a more selfish approach of corporate philanthropy as a commercial tool through marketing. The mindset of corporate philanthropy as a commitment to the common good is ingrained in the fact that a direct return is not expected for a gift. According to Godfrey (2005), “non-reciprocity condition is the acid test of philanthropic activity.” Corporate philanthropy is discretionary, voluntary, and beyond the call of duty (Collins, 1993). The payoff for companies is ambiguous and challenging to quantify (Stendardi, 1992), and the return on investment is often not evaluated. Corporate philanthropy as community-oriented investment contends that charitable activities serve company interests, albeit indirectly. “A better society produces a better environment for business” (Davis, 1973), leading to a competitive advantage for companies. Most scholars agree that companies anticipate a return on their investment of charitable efforts and good deeds (Stendardi 1992; Shaw and Post 1993). While not financial, intangible returns such as positive reputation, prestige, or employee pride are expected. Within corporate philanthropy, the most profit leaning aspect is cause-related marketing. Cause-related marketing links fundraising for a charitable organization or mission to the purchase of a service, product, or merchandise (Varadarajan & Menon, 1988; Burlingame 2001). This seemingly charitable activity tied to sales, and the evolution toward “consumption philanthropy” has led to suspicions over the “marketization” of the nonprofit sector (Nickel and Eikenberry 2009; Eikenberry and Kluver, 2004). Valid questions about real philanthropic intent are poised when corporate philanthropy becomes a marketing and sales strategy (Galaskiewicz

1989; Moir and Taffler 2004), especially since non-reciprocity is the cornerstone of philanthropy.

Research has assessed how corporate philanthropy activities are organized. While corporate philanthropy is regularly criticized for the absence of strategic value to the business (Porter and Kramer 2002; Austin 2000), industry attempts to have a philanthropic strategy to organize their charitable efforts with a mission, purpose, and procedures (Post and Waddock 1995; Saia et al. 2003). In a collaboration continuum developed by Austin (2000), business and nonprofit relationships progress through three stages of philanthropic, transactional, and integrative. The philanthropic stage has a low level of engagement, marginal importance to the company's mission, narrow scope of activities, and minor strategic value. This stage of financial support but minimal commitment characterizes most nonprofit-business relationships. However, increasing numbers are migrating to deeper engagement and building truly integrated partnerships (Austin, 2000). Regarding decision-making in corporate philanthropy, company management play a noteworthy role in influencing the breadth of charitable activities (Brammer et al., 2006), shareholders have a legitimate claim over the selection of beneficiary organizations (Brudney and Ferrell, 2002) and employees have the opportunity to give input on causes and volunteer efforts (Smith, 1994).

Existing literature has also explored the drivers of corporate philanthropy from both an individual and companywide level. From an individual level, executives have the authority, capacity, and ability to undertake charitable contributions on behalf of the firm. Studies have focused on profit maximization as a motivation, through creating goodwill and improving the company's image and reputation (Baumol 1970; Galaskiewicz, 2016; Shaw and Post 1993;

Stendardi 1992). Other motivators for executives to support corporate philanthropy include ethical considerations including a moral obligation to give (Cowton 1987; Galaskiewicz, 2016), actions as a result of benevolence, altruism, and integrity values (Choi and Wang, 2007; Seitanidi and Ryan 2007), and the level that a company president identifies as a philanthropic (Dennis, Buchholtz, & Butts, 2009). Multiple firm-level drivers of corporate philanthropy are examined in the literature. Resources are a crucial driver; companies with higher net assets or net income tend to give more (Boatsman and Gupta 1996; Burlingame and Frishkoff 1996; Dunn 2004; Galaskiewicz 1997). The influence of ownership structure on corporate giving has been studied. A case study of public companies with a CEO or similarly titled individual with significant ownership of the firm give less money (Atkinson and Galaskiewicz, 1988). The authors also confirmed the inverse; companies, where the CEO owned a small percentage of the business' stock, were more likely to donate larger gifts to nonprofits. Recent studies have both confirmed and questioned these findings. One study showed that shareholders who own at least 5% of a company (known as blockholders) were likely to limit giving by a firm (Bartkus, Morris, & Seifert, 2002). Two other studies did not find a significant influence of the presence of blockholders (Brown, Helland, & Smith, 2006) or ownership concentration (Adams and Hardwick, 1998) the levels of company charitable contributions.

Another stream of research examines the outcomes of corporate philanthropy. The most researched issue related to outcomes is the consequences of corporate philanthropic activities on company financial performance or profitability (Orlitzky, Schmidt, & Rynes, 2003; Griffin and Mahon 1997). Short of concluding corporate philanthropic efforts directly increases stakeholder value, multiple studies have found a positive relationship between the amount of corporate

giving and financial performance (Lewin and Sabater 1996; Wang and Qian 2011; Patten 2007; Su and He 2010; Wokutch and Spencer 1987). A case study of emergency giving after the 2004 tsunami found the companies that participated in the relief effort benefitted as businesses. A study found a significant positive relationship between large financial contributions and the company's stock values in the days following press releases announcing a company's gifts (Patten, 2007). Conversely, other studies found non-linear relationships (Wang, Choi, & Li, 2008) or no significant relationships (Campbell, Moore, & Metzger, 2002; Seifert et al. 2003, 2004) between corporate financial performance and the level of contributions.

Although only 5 percent of total giving is from corporations (Giving USA, 2019), over 14 percent of private funding to higher education is from companies (CASE, 2019). This increased percentage of support for higher education shows how industry values collaborating with academic institutions.

### **Higher Education Institutions and the Corporate Sector**

It is increasingly important for HEI's to generate, build, and sustain dynamic relationships with the business sector. Historically, the external partners that HEIs have benefitted most have been the government (public funding) and individual alumni (private funding). Decreasing funding from traditional sources creates challenging fiscal environments for HEI's. HEIs are seeking other resources and revenue to provide the best education to students. Building external partnerships with industry is an avenue to combat fiscal challenges and strengthen academic offerings.

Industry engagement at HEIs provides a wide range of engagement opportunities. Businesses serve as employers of graduates, benefactors, research collaborators, event sponsors,

and vendors, to name a few examples (Garber and Watts, 2019). Industry partners enhance the educational experience by providing real-world challenges for students to apply what they have learned in the classroom (Clevenger, 2014). These student enrichment opportunities occur inside and outside of the classroom. Among many engagements, company representatives speak to classes, provide challenges for student projects and sponsor business idea competitions to the benefit of the university and students (Clevenger, 2014; Walter and Watts, 2019).

Alliances between industry and universities are widespread. Collaboration between industry and universities initiate through several manners, including academic schools, centers of excellence, and career centers. To streamline efforts, companies are becoming increasingly strategic with their approach to working with universities (Bercovitz and Feldman, 2007). Partnerships are most successful when the interests of both parties are understood and aligned. Measuring the success of these partnerships can be difficult, although metric frameworks have been proposed around research partnerships (Perkman et al., 2011). Industry goals for academic engagement include recruiting top talent, funding basic and applied research, driving commercialization, CSR outreach, building brand awareness, and continuing education for employees (Garber and Watts, 2019).

The majority of companies have university partnerships that include employee engagement and financial support of the school. University resources of interest to industry include recruiting top talent, faculty expertise, research collaborations, continuing education, and leadership engagement and development (Walter and Watts, 2019). Companies often invest their financial resources in the schools where they recruit the most and therefore benefit from the most. When philanthropic support benefits all parties, it is likely more sustainable and less likely

to be one of the first expenditures cut during a downturn (Ricks Jr. and Williams, 2005). Most often, corporate financial support is invested in the students, who become future graduates and future employees. For example, a Qualcomm supported scholarship may be awarded to a student excelling in a computer science degree program. That student may meet the Qualcomm recruiting staff as part of a corporate donor thank-you event. That student, valuable human capital, is now more likely to consider Qualcomm as a future employer. The company makes a charitable gift to the university, the student benefits, the university benefits, but above all, the company benefits.

Businesses build their brand on campus through career center events, engaging with student societies, supporting programs, or through student scholarships. Some companies have partnered with universities on specific pipeline building programs. For example, in response to demand from industry, MiraCosta Community College in San Diego recently built a Technology Center Institute to offer accelerated programs in high-tech manufacturing, maritime technology and biotech manufacturing (Warth, 2015). The programs are designed to meet the growing need for technical manufacturing jobs in the region. Companies understand the need to invest in the future workforce, and universities are the only producer of the critical resource of students. As the only producer of a vital resource, universities have power in the relationship with industry, but industry also has power. Companies are selective in which schools they recruit from, HEI's with strong regional reputations, as compared to national reputations have difficulty competing with Ivy League schools. Corporations have almost all the power in the relationship when working with newer and younger schools.

Partnerships between HEIs and industry build upon common interests and are most successful when a mutual benefit is achieved. Among other criteria, companies select university partners based on degree alignment with recruitment goals, research expertise, proximity, the flexibility of university's intellectual property policy and alumni affinity of corporate leadership (Garber and Watts, 2019).

Despite copious instances of highly successful and productive partnerships, interactions, and resource exchange between academic institutions and corporations are characterized as confusing and challenging. Companies and HEI's are two distinctly different types of organizations that have different missions, priorities, dynamics, and cultures. An increasing amount of research is being conducted to understand the relationship better. The majority of scholars studying corporate engagement at HEIs evaluate the research and technology transfer exchange (Etzkowitz, 2003; Dooley & Kirk, 2007; Mintrom, 2008; Galan-Muros and Plewa, 2016) or corporate social responsibility (Clevenger, 2014).

### **Resource Dependence Theory**

Resource Dependence Theory provides the theoretical framework for the three studies in this dissertation. Resources, both internal and external, are imperative to the survival of an organization. Internal resources may include human capital, sound operating procedures, facilities, financial resources, or other tangible or intangible assets. External resources include information, customers, suppliers, and services needed to conduct business. The different need for these resources make organizations dependent on the external sources of these resources. This unique inter-organizational interaction led to the creation of resource dependence theory

(RDT). RDT is comprehensive in its approach to organizations, the organizational need for resources, and the impact on the environment.

The tenets of classical organizational theories center on organizational hierarchy, bureaucracy, and managers. Early research on organizations focused on structures with inadequate consideration to certain aspects of processes, incentives, and people. From the 1900s through 1950s, research focused on a fixed configuration of an organization and how individuals played their role in the structure. Theories moved from an emphasis on a highly bureaucratized organization to organizations with reliable chains of command to more flexible and organic organizations (Rainey, 2014). Contemporary organizational theory views organizations as fluid and adaptable. These approaches recognize that employees are flexible and adjust to the needs of the organization and team. The shift from the classical views of the "one best way" approach created an environment open to theories exploring flexible variables in an organizational setting.

RDT emerged from the publication of *The External Control of Organizations: A resource dependence perspective*, by Pfeffer and Salancik (1978). Procuring external resources is an essential tenet of organizational effectiveness and the tactical and strategic management of a company. RDT is the study of how external resources impact organizational behavior. The theory is comprehensive in its approach to organizations, revolving around power, autonomy, dependence, and constraint. Autonomy is the ability of an organization to function on their own and reduce reliance on external firms. Dependency is the relationship an organization has with a needed resource, both internal and external. Dependence creates a constraint on an organization and in turn, impacts the organization's power. An organization's power impacts relationships, the environment's perception of the firm, and business transactions. A primary motivation for

organizational leadership is to ensure the survival of an organization and to enhance the organization's autonomy (Pfeffer & Salancik, 2003). Leaders balance the many variables of an organization, including the interaction between power, autonomy, and dependence.

The fundamentals of RDT are based on power. There are power struggles between internal stakeholders at an organization, both between departments and at the individual level. The sources of power and dependence are studied, as well as how they are managed and the consequence of each in an organization. (Pfeffer & Salancik, 2003). Power and dependence are obverse of each other, but organizations can also be interdependent and have control over each other. An example widely used by transaction-cost theorists is the relationship between General Motor and Fisher Body. General Motors was dependent on Fisher Body for auto bodies as the volume needed was not available at other companies. Simultaneously, Fisher Body was dependent on General Motors as it was the predominant purchases of their products (Davis and Cobb, 2010). Many organizations have interdependent partnerships leading to complex inter-organizational relationships.

RDT can be applied to adequately explain the behavior of organizations. The theory assumes that the dependence on critical resources influences the actions of and decisions made by an organization (Nienhüser, 2008). RDT recognizes that the influence of external factors on the behavior of organizations, and although constrained by resources, managers can take action to reduce the uncertainty (Hillman, Withers & Collins, 2009). Pfeffer and Salancik describe the framework of the theory as focusing on the environment, control of power, executive succession, and feedback effects.

First, the environment is a source of constraint and uncertainty for an organization. The environment is emphasized in many organizational theories, but most often highlighted on the internal processes. RDT considers the process of gaining resources from the external environment. It is essential first to understand which resources are considered critical to an organization. The criticality of resources measures the ability of an organization to function in the absence of the resources (Pfeffer and Salancik, 2003). The availability of these critical resources depends on the environment, which is the central source of uncertainty. The environment impacts the organization, and the actors in the organization influence the environment through decision making. Organizations attempt to reduce or avoid ambiguity in their situation and in turn, have better control over critical resources. The concentration of resources means the concentration of power.

Second, the distribution of power in the environment influences an organization. A central tenet of RDT is whoever controls the resources has power over the actors that need the resources (Nienhüser, 2008). This emphasis on power is a distinguishing factor for RDT. Exchange-based power is derived from Richard Emerson's power-dependence relations article in 1962. The power of actor A over actor B is obtained from the control of resources that actor B values and is not able to attain elsewhere. Actor B is dependent on actor A to the degree that actor A has power over actor B (Emerson, 1962). It is assumed that actor B would seek to reduce their dependence on resources. This reduction in reliance can be accomplished by reducing the need for resources that actor A controls or by acquiring an alternative source of resources. Pfeffer and Salancik translate Emerson's fundamental propositions to organizational behavior and expand the stream of thought in two ways. The authors consider that external demands on an

organization are not always recognized, and the variable of perception is of great importance to the behavior of an organization. They also emphasize that a relationship involves more than two actors, and the multiple actors must be considered in relationship exchanges. These exchanges occur between organizations, between departments within an organization and between individuals within departments as well. Organizations have an internal and external distribution of power. Actors with control over critical resources but not in need of the resources themselves are in a dominant position. As discussed earlier, the more dependent an organization is on resources, the more it is willing to do to reduce those uncertainties. Management of external dependency relationships is crucial to an organization's success. Internally, every actor in the organization can impact the distribution of power. Units most able to cope with the critical problems of an organization will acquire power within the organization (Pfeffer and Salancik, 2003). For example, when two organizations merge, the legal and finance departments may become the most relatively powerful departments during the transition. Power shifts depending on the current state of the organization.

Third, the connection between the distribution of power and executive succession impacts an organization. Those in power have the access and authority to decide who assumes leadership roles, and their decisions will favor individuals who can maintain and enhance the power of an organization. Power is used to influence the choice of top administrative personnel, and reproducing one's power is a primary concern for those in power. People tend to prefer people that have similar backgrounds (Pfeffer and Salancik, 2003) and attempts to maintain power contribute to the survival of the organization. Individuals focusing on reproducing their power, in turn, contribute to the organizational goals under certain conditions. With those in power

influencing who fills essential positions, they also influence future organizational actions and structure. Effective organizational leadership is a priority, and a means to an end. Effectiveness satisfies suppliers of resources and ensures the survival of the organization, to retain power (Nienhüser, 2008).

Last, every action is taken or decision made has a feedback effect. Each feedback effect influences an organization's equilibrium, whether it impacts the leadership, culture, production, or resources of the firm. Organizations are not always able to balance themselves after feedback effects. In this case, individuals within the organization may secure power by detaching themselves from the environment, and both external and internal stakeholders (Nienhüser, 2008). This shift in relationships can negatively impact the organization if it creates difficulty in securing resources. Organizational leaders, regardless of the level of dependency, should consider feedback effects on the firm's decisions.

RDT stresses that organizations exchange resources with their environment as a condition for survival. Organizations are dependent on external resources, or as previously mentioned with the General Motors example, an interdependent relationship can also exist. An interdependent relationship exists when organizations are dependent on each other for resources. Such a relationship exists between corporations and universities. Businesses and universities exchange a valuable resource in students that graduate and enter the workforce. Companies desire an educated workforce and seek a quality pipeline of future employees. Universities have multiple customers, but the primary customer is the student. Students pay tuition for the services they receive (education). Universities educate students, and upon graduation, they become a resource to corporations. The success of a university's alumni base has a direct correlation to the rankings

and prestige of the institution. University rankings consider the employment rate of graduates, entry-level salaries, and other student employment data in calculations. The trajectory of the alumnae's career can positively impact the university. Successful alumni have more capacity to financially support their alma mater and alumni in leadership roles at a corporation can have a positive impact on the relationship between the company and the university.

Within university-industry partnerships, resource scarcity serves as a motivator for meeting needs through collaboration. An accompanying concern is the potential loss of autonomy as an organization and loss of power to the resource provider (Pfeffer & Salancik, 1978). Universities have traditionally been overly dependent on government funding; they should not shift that dependence to another dominant resource provider. RDT framework also suggests that as universities rise in rankings, they will incur increased costs (Morphew & Baker, 2004; Bastedo & Bowman, 2011), and in turn, must develop new resources to account for this increased expense. These associated new expenses are rarely curtailed due to the continuous university pursuit of status and rankings. This phenomenon results in universities becoming dependent on both existing resource streams and the pursuit of new resources in perpetuity (Cheslock & Gianneschi, 2008; Morphew & Baker, 2004; Bowen, 1980; Pfeffer & Salancik, 2003; Bastedo & Bowman, 2011).

Universities will use all efforts to enhance reputational prestige and capital, and also to run the institution; there are never enough resources to do both (Bowen, 1980; Ressler & Abratt, 2009). Amplified pressure for HEI's to pursue new resource streams should be proceeded with caution. Organizations desperate for additional resources may explore opportunities that are different from their core-conceived missions (Slaughter & Rhoades, 2004; Slaughter & Leslie,

1997). The resource exchange in university-industry partnerships can be both mutually beneficial and include power shifts between organizations.

## **The Studies**

This dissertation examines the university-industry resource exchange through three studies. First, Chapter 2 expands on two streams of literature: existing revenue diversification research with a study on higher education budgets and state funding research by analyzing the university response of increasing development office budgets. Second, Chapter 3 provides an industry perspective on the relationship between companies and HEIs. The majority of the limited research on university-industry partnerships has provided an academic perspective on the relationship. The impact of engagement tools, academic goals, and selection criteria will have implications for companies seeking to improve their satisfaction with university partners. The last study in Chapter 4 analyzes collaboration factors influencing university-industry engagement through an academic lens, exploring how leadership, communication, conflict, trust, and commitment impact the success of university-industry partnerships. Understanding perspectives of both sides of university-industry partnerships in one comprehensive study is distinctive.

Corporate philanthropy remains an intriguing phenomenon which is yet to be adequately understood (Gautier and Pache, 2015). Corporate philanthropy literature has not fully explored university-industry engagement. Existing literature on university-industry engagement has primarily focused on knowledge transfer and research relationships. This dissertation is distinct as it provides a perspective on the comprehensive partnership from both the university and industry side. The final chapter presents a summary of findings from the research, theoretical and practical contributions. The results will be informative to both scholars and practitioners.

## CHAPTER 2

### REVENUE DIVERSIFICATION AT PUBLIC HIGHER EDUCATION INSTITUTIONS

#### Introduction

Higher education institutions (HEIs) are plagued with problems of financial austerity due to, and perhaps despite, the increase in demand. Costs tend to be high throughout the world due to labor costs of faculty, expensive equipment, and student living, which is an indirect cost of education but a high cost nonetheless. (Johnstone, 2002). The labor-intensive nature of higher education results in the price, called tuition, generally outpacing the rate of inflation. This tendency of rising relative costs is known as cost disease. Cost disease is prevalent in labor-intensive and productivity-immune sectors such as education, healthcare, the majority of services, and the arts (Johnstone, 2002). Rising tuition costs in higher education have become a focal point of critics and a subject of the proposed reform. Two revenue streams generate the majority of public university funding: state funding and tuition & fees. Other revenue streams include federal grants & contracts, endowment & interest income, local government grants, sales & services, net auxiliary enterprises, and private gifts & grants (Texas Higher Education Coordinating Board, 2018).

Tuition costs are rising dramatically. In the last 40 years, the rising cost of attending a four-year public university has significantly outpaced real median income. Since 1973, inflation-adjusted average tuition at a public university has increased 274 percent, while the median household income has increased by only 7 percent (Mitchell, Leachman & Masterson, 2016). During the same period, the increase in tuition costs also outpaced the income of the top 1

percent of earners, whose income increased by 170 percent. The most significant discrepancy between the rise in tuition costs and real median income occurred since the recent recession. Between the 2007-08 and 2014-15 school years, tuition rose nearly 30 percent while median income fell by 6.5 percent (Mitchell et al., 2016). While it is only one revenue stream for public universities, tuition increases have limits and are scrutinized, mainly related to inhibiting student access to college. Although public universities can raise tuition, continual increases are met with resistance and must be approved by the university's governing body. Regardless of the desires of public university leadership, HEIs do not have the authority to increase tuition costs to meet their funding needs continuously.

In addition to tuition revenue, public universities in the US rely heavily on government funding. The recession negatively affected funding levels of many public services, notably higher education. Reducing the financial support of public colleges was a consistent cost-saving strategy across states as the government attempted to recover from the recession. State tax revenues fell sharply during the recession, affecting the government's primary source of income. To close the budget deficits, most states made sizeable budget cuts versus a balanced approach of a mix of cuts and tax revenue increases. During the recession recovery period between 2008 and 2012, 45 percent of the state budget deficits were recovered through reduced financial support for public services, while 16 percent was made up in increased taxes and fees (Mitchell et al., 2016). Following the 2008 recession, higher education is experiencing a slow recovery in state funding levels.

State funding to public universities is decreasing, and the most drastic changes have occurred since the recession. Between the 2007-08 school year and 2015-2016 school year, state

spending on higher education declined 18 percent, an average of \$1,598, per student (Mitchell et al., 2016). Of the 50 states, 26 states cut funding per full-time student equivalent (FTSE) by more than 20 percent, nine states decreased financing per FTSE by over 30 percent and Arizona and Illinois cut funding by more than 50 percent (Mitchell et al., 2016). After five years of increases in local and state support to recover from the cuts during the recession, there was little change between 2017 and 2018. At the national level, appropriations per FTSE also remained flat between 2017 and 2018 (State Higher Education Executive Officers Association, 2018). Although appropriations have remained flat, funding levels vary significantly by state. In 2018, 22 states experienced decreases in per-student appropriations.

Since the Great Recession funding reductions of \$2,000 per-student, only \$1,000 per-student educational appropriations has been recovered. In other words, “ten years out from the start of the Great Recession, per-student higher education appropriations in the U.S. have only halfway recovered” (State Higher Education Executive Officers Association, 2018). Only nine states have returned to their pre-recession higher education spending and eleven states have not recovered at all, with current spending levels lower than the low point of the recession.

As state funding slowly returns to 2008 funding levels, enrollment growth has slowed. Enrollment at public HEIs increased 8.6 percent, or 900,000 FTSE, between the 2007-08 school year and 2014-15 school year (State Higher Education Executive Officers Association, 2018). Since 2015, enrollment growth has slowed and in many states, declined. Between 2017 and 2018, FTSE enrollment declined in 35 states and Washington, D.C. Nationally, there was a 0.3 percent decrease in FTSE enrollment between 2017 and 2018 (State Higher Education Executive Officers Association, 2018).

The combination of declining and fluctuating government funding and shrinking enrollment numbers creates uncertainty for HEI's. Financial conditions of HEIs are uneven and deteriorating, mainly due to the extent that public universities are dependent on government or tax generated, revenue (Johnstone, 2002). In response to challenging financial conditions, HEIs can reduce their economic dependence on taxpayers (via the government), increase cost-sharing and diversify their sources of revenue (Johnstone, 2002). Unlike a private company selling a high in-demand product, public universities cannot continually increase their tuition to cover their costs. Public education is considered a public good. Historically, multiple levels of government funding have subsidized higher education. However, public funding is decreasing, changing the vernacular from state-funded universities to state-assisted universities.

The financial future of public higher education looks bleak with the combination of increases in demand, decreases in state funding and tuition increase limits. To reduce the reliance on state funding and future funding volatility, HEIs can diversify their revenue streams. Derived from Modern Portfolio Theory, the goal of revenue diversification is to decrease the instability of particular revenue sources and better prepare for economic downturns. Increasing the number of revenue sources or the level of reliance on a primary source reduces the amount of possible volatility in a budget. Research on revenue diversification in higher education is somewhat limited. As a result, this study examines revenue diversification at public universities. The present study examines the impact of changes in state funding levels to public universities, and the effect state funding changes have on revenue from private gifts & grants. In particular, this research seeks to answer the following questions: (1) What impact do state funding changes have on revenue diversification at public universities?; (2) What impact do state funding changes have

on public university revenue from gift sources?; (3) What impact do state funding changes have on public university revenue from government grant sources?; and (4) As a response to decreasing state funding, do universities increase their development office budgets?

### **Higher Education in the State of Texas**

Texas has the second-largest student enrollment at HEIs after California. Texas is home to 148 public and private universities. There are 36 public universities in Texas, of which 32 institutions belong to a university system, and four are independent. Discovery of oil on Permanent University Fund (PUF) land helped fund the rapid expansion of the state's two largest university systems: The University of Texas System and the Texas A&M System. The other four university systems, not funded by the PUF, are the University of North Texas System, the University of Houston System, the Texas State System, and the Texas Tech System (Texas Higher Education Coordinating Board, 2018).

The flagship institutions of their namesake systems, Texas A&M University and The University of Texas at Austin, are highly ranked and each enrolls 50,000 plus students. Joining Texas A&M University and the University of Texas as Carnegie Classification R1 research institutions are: Texas Tech University, University of North Texas, University of Houston, The University of Texas at Dallas, The University of Texas at Arlington, and The University of Texas at El Paso. Texas is home to eight of the 86 public universities with Carnegie R1 Status nationwide.

In 2018, Texas allocated 7.8% of state and local government funding to higher education, compared to the average across the US of 5.8%. Since 2006, student enrollment in Texas increased by 28.3 percent, and since 2015, enrollment has increased by 4.1 percent (Figure 3).

Although state funding per FTSE decreased 18 percent since the beginning of the recession, from \$9,419 to \$7,707 per FTSE, Texas ranks 17<sup>th</sup> among states for educational appropriations per FTSE. Compared to other states, average tuition in Texas ranks 23<sup>rd</sup> for public, four-year institutions at an average of \$8,375. Texas ranks 34<sup>th</sup> among states for bachelor’s degree or higher educational attainment, with 31% of individuals ages 25 to 34 years old earning a four-year degree. (Texas Higher Education Coordinating Board, 2018).

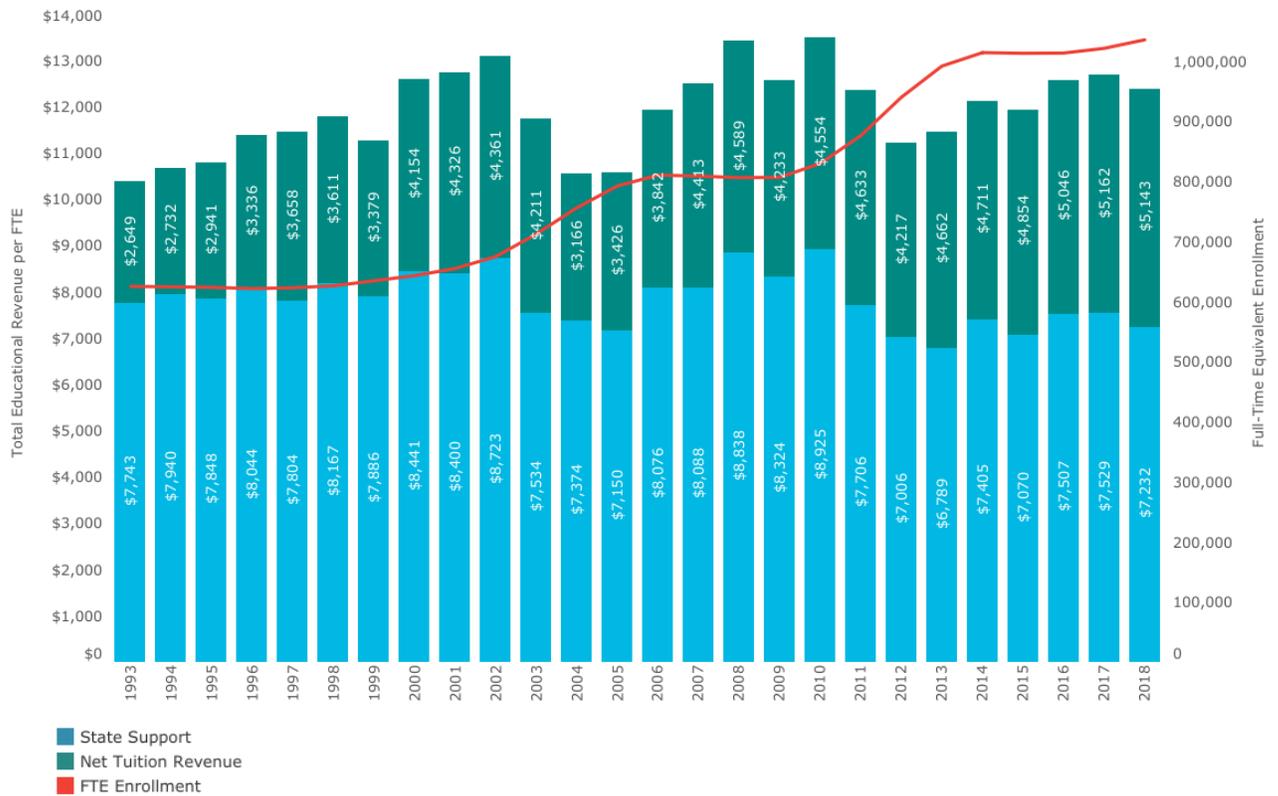


Figure 3: Texas Educational Appropriations, Net Tuition Revenue and FTSE Enrollment (1993-2018)  
 (State Higher Education Executive Officers Association, 2018).

## **Resource Dependence Theory**

As reviewed in Chapter 1, organizations depend on a multitude of external and internal resources to thrive. Internal resources include human capital, facilities, and policies, and procedures. External resources include revenue, information, and customers. Different needs for these resources make organizations dependent on the external sources of these resources. This unique inter-organizational interaction led to the creation of resource dependence theory (RDT). RDT is comprehensive in its approach to organizations, the organizational need for resources, and the impact on the environment. Financial resources and revenue streams are crucial to the operations and survival of an organization. RDT stresses that organizations exchange resources with their environment as a condition for survival. RDT provides the theoretical framework for this study.

At universities, resource scarcity serves as a motivator for meeting needs through collaboration. This motivation creates a concern for the potential loss of autonomy as an organization and loss of power to the resource provider (Pfeffer & Salancik, 1978). The constant race to rise in the rankings whilst increasing university prestige results in universities becoming dependent on both existing resource streams and the pursuit of new resources in perpetuity (Cheslock & Gianneschi, 2008; Morphew & Baker, 2004; Bowen, 1980; Pfeffer & Salancik, 2003; Bastedo & Bowman, 2011).

HEI's, like all organizations, should not be over-dependent on one resource provider. However, the shift from being overly dependent on government funding should not result in becoming equally dependent on another dominant funding source. This study assesses the shift of funding towards private gifts and government grants. Universities have more power over these

two revenue streams than other resources. However, the shift towards another potentially dominant resource provider should be guided with caution.

### **Revenue Diversification in Higher Education Institutions**

Higher education faces increased demand to deliver while experiencing rapidly growing enrollment. Increased demand leads to amplified strains placed on the higher education system to deliver, despite challenging financial conditions. To meet the increased demand, HEIs need increased revenue, and the assumption is that increased public revenues will not meet the deficit. Relying on increased public revenue to HEIs is becoming less likely due to tax capacity, globalization, and competing funding needs (Johnstone, 2002). The limitation of tax capacity prevents an ever-increasing revenue stream for governments. Globalization is also taking a toll on the ability of governments to tax, as corporations are easily able to move to lower tax jurisdictions. A final limitation includes competing needs for government funding, including primary and secondary education, infrastructure, public health, and care for impoverished seniors and children (Johnstone, 2002). While higher education is equally important, universities can raise their costs by raising tuition and fees or leasing university assets such as faculty expertise or equipment. The ability for HEIs to generate their revenue and increase their prices seems to create a perceived advantage over competing needs that do not share that same opportunity.

Increasing demand for services, increasing enrollment, decreasing state funding, and caps on tuition increases create challenging financial conditions for HEIs. Public universities receive the majority of their funding from two revenue sources: state funding and tuition & fees. The concept of revenue diversification suggests transitioning beyond two primary revenue sources would increase revenue stability.

The concept of revenue diversification has evolved in academic literature over the last 60 years. Markowitz (1952) articulates the origins of the idea, found in Modern Portfolio Theory, through his research on portfolio selection. Markowitz described the portfolio selection process and the dichotomy between desired high returns and the undesirable variance from the expected returns (Markowitz, 1952). Selecting an optimal portfolio that maximizes expected returns while minimizing variance is a difficult task. Markowitz encouraged the right kind of diversification for the right reasons. The adequacy of diversification is not solely dependent on the number of different securities in a portfolio. Diversification cannot eliminate all variance (Markowitz, 1952), although it has been found to decrease portfolio volatility for a given expected return (Williams, 1997).

Since beginnings in 1952, Modern Portfolio Theory has been adapted and applied in the analysis of resource acquisition strategies of a variety of organizations. Portfolio diversification was applied to government tax structures; translating the risk-return mentality of financial securities to the growth-instability approach of government finances. Governments consider the volatility of individual revenue sources and growth rates when making decisions about the design of tax structures (White, 1983). Governmental entities aim to decrease the variance in their expected revenue streams. The purpose of diversification, precisely at the government level, is to collect revenue from tax sources with varying degrees of volatility to increase the stability of overall revenue (White, 1983).

Research on revenue diversification has been conducted at multiple levels of government. The Great Depression, the decrease in property values, and in turn, property taxes, is considered to have triggered the consideration of revenue sources in addition to property taxes. The result

was a shift to increased reliance on two alternative revenue streams: general sales tax and personal income tax (Ulbrich, 1991). At the state level, Shannon (1987) argued that revenue diversification led to better financial performances. A study on all 50 states over time showed diversification helps reduce revenue volatility, helping to insulate state governments from economic downturns and fiscal crises (Carroll, 2005). At the local level, revenue diversification was tested using panel data from 1970 – 2002, on 28,185 observations of municipal governments with populations higher than 25,000. Findings suggest that both non-tax and tax revenue diversification variables decrease revenue volatility in municipalities (Carroll, 2009). An unforeseen consequence is that diversification may create a more significant reliance on revenue sources that may be less stable than property tax. By increasing dependence on less stable revenue sources, diversification can create more volatility rather than stability (Carroll, 2009). Applied to government, the overall goal of revenue diversification is to decrease the instability of the whole tax structure and better prepare for economic downturns by diversifying revenue streams (Carroll, 2009).

Revenue diversification has also been applied to nonprofit organizations. While mission fulfillment and serving the community are primary goals of nonprofits, Tuckman and Chang (1992) assert that organizational surplus can be related to increased effectiveness and the organization's longevity. Similar to the private and public sector, nonprofit managers assess the financial risks and expected returns of potential funding streams in their revenue structures (Jegers, 1997). This approach parallels the principles of Modern Portfolio Theory and governmental decision-making. Donations are generally the most significant source of nonprofit revenue. The primary dependence on donation revenue makes organizational budgets uncertain

and susceptible to economic downturns. In addition to donations, nonprofits may also rely on grants, sales of goods and services, and contracts for service as revenue. Nonprofit organizations experienced more volatility when they relied primarily on donations as revenue (Carroll and Stater, 2008). Diversified portfolios can decrease the instability of relying on individual contributions as a primary revenue source.

Diversifying revenue sources is consistently shown to reduce financial vulnerability at nonprofit organizations. Diversification is positively correlated with nonprofit financial health, as demonstrated by more considerable net assets and higher operating margins (Tuckman and Chang, 1991). Greater revenue diversification decreases the likelihood of an organization cutting programs or experiencing a loss in net assets over three years (Greenlee and Trussel, 2000) and decreases closure in arts organizations (Hager, 2001). Tested inversely, revenue concentration leads to a dramatic decline in revenue and an increased risk of insolvency (Keating, Fischer, Gordon, & Greenlee, 2005). Nonprofit organizations with more substantial total expenses and larger fund balances have reduced volatility (Carroll and Stater, 2008). This finding suggests that larger nonprofits experience less revenue volatility. For nonprofit organizations, diversification can bring greater stability, but the primary concern with diversification in nonprofits is the issue of mission drift (Carroll, 2009). For example, additional revenue streams such as selling t-shirts, hosting cooking classes, or opening up a restaurant can dilute an organization's primary mission of delivering free meals to the homeless population.

Higher education faces revenue limitations similar to state and local government and nonprofit organizations. Academic literature has explored revenue diversification in higher education. Revenue diversification is suggested as a strategy to reduce financial dependence on taxpayers

(via the government). A revenue diversification study on HEIs in Portugal showed an increase in the percentage of revenue from tuition and a decrease from public funding between 1998 and 2009. The research indicates that generating additional revenue streams is not simple or easy, and that revenue diversification tends to reach a ceiling challenging to grow beyond (Teixeira and Koryakina, 2013). A subsequent study on the Portuguese HEIs analyzed variables relevant to revenue diversification, finding the most significant impact with the qualification of academic staff (although more qualified staff are also a more considerable expense) and institution location was less relevant than expected (Teixeira et al., 2014).

Scholars have explored university responses to decreases in state funding. Multiple studies found that public universities attempt to grow research revenues in response to declining state appropriations (Slaughter and Leslie, 1997; Slaughter and Rhoades, 2004). Curs (2015) found that universities respond to the decrease by increasing out of state freshman enrollment as a revenue stream. Curs states that the result of disinvestment from the state is that public universities act more like a private university and seek out paying customers. Cheslock and Gianneschi (2008) researched the association between institutional state appropriations and revenue generated from giving and the subsequent effect on resource disparities among public institutions. The authors failed to confirm their hypothesis that declines in state appropriations are associated with increases in private gifts and investments during the years 1994-2004. Their findings provided evidence that state appropriations and voluntary support were positively correlated. Further, they found the reliance on voluntary support exacerbates inequality across public universities due to the selectivity involved in donor behavior.

This study contributes to the existing literature by combining revenue diversification analysis and response behavior analysis. Specifically, do universities respond to decreasing state funding by increasing their Development Office budget.

*H<sub>1</sub> Decreasing state funding will increase revenue diversification.*

*H<sub>2</sub> Decreasing state funding will increase revenue diversification, specifically from gifts.*

*H<sub>3</sub> Decreasing state funding will increase revenue diversification, specifically from government grants.*

*H<sub>4</sub> Decreasing state funding will increase university development office budgets.*

## **Data & Methods**

Revenue diversification is analyzed through data acquired from the Texas Higher Education Coordinating Board (THECB). The sample includes 36 public universities in the state of Texas. Texas has the second-largest student enrollment at HEIs after California. The expansive higher education network in Texas provides a large sample of institutions for the study. The dataset includes 390 observations from 36 public universities annual financial reports from each university for over eleven years, from 2008 to 2018. The THECB report on *Revenue Sources, Uses, and Research Expenditures* includes revenue reported through twelve categories. The twelve revenue sources are combined to create six revenue variables. Four of the revenue classifications are State of Texas funding and are grouped to create the independent variable of state funding. State funding variables include state appropriations, state grants & contracts, Higher Education Fund, and University Fund Excellence. The remaining revenue sources include

tuition, fees, government grants, endowment & interest income, sales & services, net auxiliary enterprises, other income, and private gifts.

Private gifts and endowment & interest income are combined to create the variable private gifts. Revenue from sales & services, net auxiliary enterprises, and other income are combined to create a variable titled external sales. Net auxiliary enterprises include revenues derived from a service to students, faculty, or staff in which a fee is charged that is directly related to, although not necessarily equal to the cost of the service (Texas Higher Education Coordinating Board, 2019). Examples of net auxiliary enterprises include revenue include campus bookstores, dormitories, dining halls, and intercollegiate athletic programs. Sales & services include revenue related to the conduct of instruction, research, and public service and revenues from activities that exist to provide an instructional and laboratory experience for students that create goods and services that may be sold. Examples include revenues from activities such as performing arts, continuing education, charter schools, and sports camps (Texas Higher Education Coordinating Board, 2019).

The revenue variables are (1) state funding, (2) government grants, (3) external sales, (4) tuition, (5) fees, and (6) private gifts. These variables are used to calculate a revenue diversification score for each institution.

The distribution between revenue streams has fluctuated slightly over the years (Table 1). Summary statistics show that the majority of funding to Texas public universities in 2018 is from state funding (28.6%) and tuition (21.8%). External sales account for 16.0%, federal & local grants account for 13.9%, fees account for 9.4%, and private gifts account for 10.4%.

Table 1: Texas Public HEI Revenue Streams 2008-2018, by percentage  
(Texas Higher Education Coordinating Board, 2019)

Year	State Funding	Tuition	Fees	External Sales	Gov Grants	Gifts
2018	28.6%	21.8%	9.4%	16.0%	13.9%	10.4%
2017	29.5%	21.7%	9.7%	16.2%	13.6%	9.4%
2016	30.0%	21.7%	10.2%	15.6%	13.4%	9.2%
2015	28.5%	21.6%	9.9%	15.6%	14.2%	10.2%
2014	27.6%	19.6%	9.4%	14.5%	13.7%	15.2%
2013	27.8%	20.3%	9.6%	14.8%	16.7%	10.7%
2012	29.0%	21.0%	9.9%	14.3%	16.4%	9.4%
2011	30.8%	19.1%	9.4%	13.6%	17.9%	9.1%
2010	32.7%	17.7%	9.4%	13.3%	17.9%	9.0%
2009	35.2%	18.5%	9.5%	14.0%	14.7%	8.0%
2008	34.9%	17.2%	9.7%	13.7%	13.5%	10.9%

From 2008 to 2018, the percentage of funding from the state decreased from 34.9% to 28.6% (Table 2). Since 2008, the total revenue of Texas HEI's has increased \$5.45 billion, and FTSE has increased 115, 667 students. While the percentage of state funding decreased 6.3 percent, the amount in dollars increased \$931 million (Table 2).

Table 2: Texas Public HEI Revenue Streams 2008 and 2018  
(Texas Higher Education Coordinating Board, 2019)

Year	FTSE	Total Revenue	State Funding	State Funding %
2018	545,339	\$ 15,269,136,227	\$ 4,359,441,322	28.6%
2008	429,673	\$ 9,817,822,525	\$ 3,428,251,977	30.0%

In addition to the revenue streams, the other dependent variable is development office budgets. Additional data collection acquired the development office budgets from the 36 public HEI in Texas. Public information requests were submitted to each university in the sample. Public universities are required to comply to the best of their ability through the Public Information Act. A few universities were unable to provide development budgets in earlier years for a multitude of reasons including the university did not track the level of details or that the period requested had exceeded the State's required retention period.

The primary relationship of interest is the impact of the independent variable state funding. The first and second hypotheses test the impact state funding has on revenue streams from private gifts and government grants. The third hypothesis considers a potential university response to decreasing state funding, examining whether the university increases its development budget as a response. Control variables include (1) university full-time student equivalent (FTSE) enrollment, (2) total university funding, (3) university age, (4) research university status, and (5) urban university location.

### The Models

$$\begin{array}{l}
 \textit{Revenue Diversification} \\
 \textit{Private Gifts} \\
 \textit{Government Grants} \\
 \textit{Development Budget}
 \end{array}
 \left. \vphantom{\begin{array}{l} \textit{Revenue Diversification} \\ \textit{Private Gifts} \\ \textit{Government Grants} \\ \textit{Development Budget} \end{array}} \right\} = \beta_0 + \beta_1 (\textit{state funding}) + \beta_2 (\textit{controls})$$

State funding of universities ranges from \$60,000 to \$743.88 million, with a mean of \$105.55 million and standard deviation of \$124.52 million (Table 3). Funding from gift

sources ranges from \$170,000 to \$811.75 million, with a mean of \$35.7 million and standard deviation of \$95.82 million. Government grant funding ranges from 0 to \$508.15 million, with a mean of \$52.46 million and a standard deviation of \$79.46 million. Development Office Budgets range from \$41,000 to \$50.17 million, with a mean of \$3.91 million and a standard deviation of \$7.68 million (Table 3).

Summary statistics on control variables share details on the HEI's in the sample (Table 3). University enrollment for full-time student equivalent (FTSE) ranges from 1,090 to 55,775, with a mean of 13,729 and standard deviation of 12,498. Total funding of universities ranges from \$12.93 million to \$2.95 billion, with a mean of \$350.22 million and standard deviation of \$489.65 million. University age ranges from 10 to 148 years, with a mean age of 85 and a standard deviation of 38 years.

Control variable research university status is a dichotomous variable using data from the Carnegie Classification. The HEIs in the sample considered a research university are categorized as RI Institutions in the ranking of Doctoral Universities with the Highest (also known as RI Institutions) and Higher Research Activity. The majority of HEIs in the sample are not research universities (25, 70%), with 11 HEI's ranked as research universities (30%). Urban university location is calculated using the metropolitan statistical area population. HEIs are categorized in urban locations if they are located in a county with a population greater than 200,000. A little over half of the HEIs in the sample are in urban locations (20, 55%) and the remaining HEIs are located in more rural locations (16, 45%)

Table 3: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Revenue Diversification (HHI)	390	0.896	0.074	0.512	0.982
State Funding (x1,000,000)	390	\$ 105.55	\$ 124.52	\$ 0.06	\$ 743.88
Gift Funding (x1,000,000)	390	\$ 35.70	\$ 95.82	\$ 0.17	\$ 811.75
Government Grant Funding (x1,000,000)	390	\$ 52.46	\$ 79.46	\$ -	\$ 508.15
Development Office Budget (x1,000,000)	348	\$ 3.91	\$ 7.68	\$ 0.04	\$ 50.17
Total Funding (x1,000,000)	390	\$ 350.22	\$ 489.65	\$ 12.93	\$ 2,948.53
Enrollment FTSE (x1,000)	390	13.73	12.5	1.09	55.77
University Age	390	85	38.02	10	148
Research University	390	0.31	0.46	0	1
Large University	390	0.45	0.49	0	1
Urban University Location	390	0.55	0.49	0	1

For this study, revenue diversification is operationally defined as the mean earned income percentages, as compared to total revenue, of the university. Revenue diversification is measured through the Hirschman-Herfindahl Index (HHI), the most common approach for measuring revenue diversification/concentration. Through this approach, a diversification score ranging from 0 to 1 is calculated based on how evenly balanced organization's revenue is among selected categories (Carroll & Stater, 2008; Carroll, 2005). An increasing RD value indicates greater diversification. Public university revenue diversification is calculated with the following formula:

$$RD = \frac{1 - \sum_{i=1}^n R_i^2}{(N - 1)/N}$$

The measure incorporates the six revenue sources for public universities included in this study. In this formula,  $R_i$  is the fraction of revenue generated by each of the  $N$  revenue sources ( $N = 6$ ). This study's measurement of revenue diversification incorporates the seven revenue categories referenced above. A revenue diversification score is calculated for each of the 36 public universities over the eleven years captured in the dataset using the following formula:

$$RD = \frac{1 - \sum_{i=1}^6 R_i^2}{.8333}$$

Summary statistics on the sample's HHI are included in Table 3. The HHI scores range from 0.512 to 0.982, with a mean of 0.896 and standard deviation of 0.074.

Regression analyses are run to analyze the impact of state funding changes on HHI, revenue from private and grant sources, and on the development office budget.

## Findings

The analysis evaluates the impact of decreased state funding on revenue diversification, gift and grant revenue streams, and on university development office budgets. The model is estimated using a fixed effect regression analysis in two models, controlling for year and year and school.

As shown in Table 4, state funding and revenue diversification have a significant negative relationship ( $p < 0.01$ ). As state funding decreases by one million dollars, revenue diversification increases over time ( $\beta = 0.066$ ). While the relationship in model 1 is statistically significant, the effects are not large. These results confirm Hypothesis 1. When analyzing the fixed effect within

each university, state funding and revenue diversification also have a negative relationship. Although not significant, each million-dollar decrease in state funding increases revenue diversification over time ( $\beta = 0.010$ ). Regarding control variables, older, larger, research universities are associated with increased revenue diversification over time, and statistically significant ( $p < 0.01$ ).

Table 4: Regression Analysis, Revenue Diversification

	(1)	(2)
REVENUE DIVERSIFICATION	[Year Fixed]	[School, Year Fixed]
State Funding (in millions)	-0.0660*** (0.0153)	-0.00955 (0.00657)
Enrollment (in thousands)	0.296*** (0.0374)	-0.0785 (0.0951)
Research University	2.057*** (0.339)	-1.685** (0.672)
Urban Location	-0.378 (0.692)	27.89*** (6.099)
University Age	0.0654*** (0.00782)	0.357*** (0.0579)
Total Funding (in millions)	0.0122** (0.00403)	-0.00713*** (0.00154)
Constant	82.24*** (1.225)	49.12*** (6.340)
Year Fixed Effect	Yes	Yes
School, Year FE	No	Yes
Observations	390	390
R-squared	0.368	0.862
Number of years	11	11

Robust standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

The second set of analyses observes the impact of state funding on gift revenue (Table 5). State funding and gifts have a negative relationship in both Model 3 and Model 4. In Model 3, results show that decreases in state funding are associated with an increase in gift revenue over time ( $\beta = 0.490$ ). Every one million dollar decrease in state funding is associated with about a \$500,000 increase in gift revenue over time. This result is in line with Hypothesis 2, but the result is not statistically significant.

Table 5: Regression Analysis, State Funding Impact on Gifts and Grants

	(3) Gifts	(4) Gifts	(5) Government Grants	(6) Government Grants
State Funding (in millions)	-0.490 (0.379)	-1.198** (0.525)	-0.125 (0.246)	0.0104 (0.108)
Enrollment (in thousands)	-3.010*** (0.579)	-8.055** (2.559)	-1.129 (0.658)	1.101 (0.643)
Research University (1 = Yes)	-14.90* (7.327)	13.96 (9.520)	-10.34 (6.910)	15.76*** (1.730)
Urban Location (1= Yes)	-11.66** (4.000)	109.2 (99.14)	24.61*** (1.730)	218.4*** (32.81)
University Age	-0.0917*** (0.0229)	1.107 (0.836)	0.109*** (0.0314)	1.693*** (0.282)
Total Funding (in millions)	0.387*** (0.0978)	0.568*** (0.172)	0.203*** (0.0601)	0.0671* (0.0349)
Constant	11.85** (4.870)	-103.5 (107.1)	-9.630*** (2.737)	-236.5*** (35.75)
Year FE	Yes	Yes	Yes	Yes
School, Year FE	No	Yes	No	Yes
Observations	390	390	390	390
R-squared	0.937	0.966	0.858	0.988
Number of years	11	11	11	11

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

When the additional fixed effect of school is analyzed, state funding and gifts have a statistically significant ( $p < 0.01$ ) negative relationship ( $\beta = -1.198$ ). Every one million dollar decrease in state funding is associated with about a \$1.2 million increase in gift revenue over time. This result confirms Hypothesis 2. Concerning control variables, statistically significant associations are found with enrollment ( $p < 0.01$ ), research status ( $p < 0.1$ ), institution age ( $p < 0.01$ ) and university location ( $p < 0.05$ ) in Model 3. Older, larger, research universities in an urban location experience an increase in gift funding as state funding decreases. Enrollment has a statistically significant association with both Model 3 ( $p < 0.01$ ) and Model 4 ( $p < 0.05$ ), increasing gift revenue by \$3 million and \$8 million, respectively.

Table 5 also includes the analysis of state funding and government grant revenue. State funding and grant revenue from government sources have a negative relationship with ( $\beta = -0.125$ ). Decreases in state funding are associated with increases in government grant revenue. Every one million dollar decrease in state funding is associated with a \$125,000 increase in grant revenue over time. This result supports Hypothesis 3. The relationship shifts when the additional fixed effect of school is analyzed. When controlling for school, state funding and grant revenue have a positive relationship ( $\beta = 0.010$ ). The results of Model 6 do not support hypothesis 3.

Analyses of university development office budgets show positive relationships with state funding (Table 6). State funding increases are associated with increases in development budgets over time, when controlling for both year ( $\beta = 0.035$ ) and year and university ( $\beta = 0.048$ ). In Model 7 and Model 8, every one million dollar increase in state funding is associated with \$35,300 and \$47,500 increase in development office budgets over time, respectively. This result disproves Hypothesis 4.

There are interesting results with control variables. Statistically significant associations are found with enrollment ( $p < 0.05$ ), research status ( $p < 0.5$ ), institution age ( $p < 0.01$ ) and university location ( $p < 0.01$ ) in Model 7. Older, larger, research universities in an urban location experience an increase in development office budget as state funding decreases. University age and urban location have a statistically significant ( $p < 0.01$ ) association with both Model 7 and Model 8 (Table 6).

Table 6: Regression Analysis, State Funding Impact on Development Office Budgets

	(7)	(8)
	Development Budget	Development Budget
State Funding (in millions)	0.0353*** (0.00954)	0.0475 (0.0264)
Enrollment (in thousands)	-0.0840** (0.0294)	-0.297 (0.177)
Research University (1= Yes)	-1.136** (0.395)	1.317** (0.449)
Urban Location (1= Yes)	-1.497*** (0.170)	-32.94*** (9.292)
University Age	-0.0149*** (0.00349)	-0.297*** (0.0778)
Total Funding (in millions)	0.00844*** (0.00187)	0.0212** (0.00756)
Constant	0.438** (0.140)	35.04*** (9.996)
Year FE	Yes	Yes
Year, School FE	No	Yes
Observations	348	348
R-squared	0.886	0.966
Number of years	11	11

Robust standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## **Discussion**

Can public universities impact their revenue diversification? Texas has experienced decreases in state funding to education, but it remains the most significant percentage of funding. Declines in the percentage of HEI's budget from state funding was expected and confirmed, to increase revenue diversification. Hypothesis 1 is confirmed in both Model 1 ( $p < 0.01$ ) and Model 2. Decreases in state funding are associated with Texas public universities are diversifying their revenue streams. The coefficients are not large, which is expected within the confines of a HHI score of 0 to 1. Texas HEI budgets are large, and slow shifts in revenue stream ratios are being observed. Revenue diversification is expected to increase and will continue to increase at the current measured pace. More substantial shifts in revenue diversification are expected to be observed over a more extended period, and an expanded data set over 20-30 years will better evaluate this shift.

In addition to assessing revenue diversification, additional research is needed to understand the HEI's ability to impact their revenue streams. For example, there are limits on increasing tuition, and price adjustments must be approved. While public HEI's may not be able to adjust tuition prices at their leisure, they can control other revenue streams or the effort to increase the revenue stream. Among many examples, universities can increase student fees, invest in real estate, select an investment firm that may produce better returns on their endowment portfolio, or decide to manage their dorms versus paying an outside firm. Additional effort can also be placed on soliciting gift and grant revenue, which is a central focus of this study.

The reduction in state funding was expected to produce an increase in revenue from private gifts (Hypothesis 2). Both gift analyses produced a negative relationship between state funding and gift revenue, with Model 4 ( $p < 0.05$ ) confirming Hypothesis 2. While not necessarily a resource under control, the additional output from gift revenue can be expected with additional effort input. While gift revenue is increasing, attention should be paid to the type of funding in HEI's budgets. State funding supports operating and non-operating expenditures. A majority of gift revenue supports students, faculty, and capital needs on a university campus. Private gifts are usually restricted to areas where donors feel they are making a difference in a student's life or with faculty research. In most cases, gifts do not cover operating expenses. This shift in resources should be analyzed further as operating funds are necessary to conduct business as a university.

Decreases in state funding were expected to produce an increase in revenue from government grants (Hypothesis 3). Hypothesis 3 is supported in one of the grant models but is not confirmed. Securing government grants is a more intricate process compared to soliciting private gifts. Government grants support faculty research and are often extended over a multi-year funding period. Universities can increase their proposals for government grants by recruiting top faculty to the university and through additional research development staff, and faculty training. Government grants are highly competitive and a resource that may not be able to be directly impacted by increased effort.

HEIs experience increased pressure to solicit funding from the external resources of private donors. As a response to decreased state funding, universities could respond by increasing their Development Office budget (Hypothesis 4). This hypothesis was rejected; state

funding and Development Office budgets have a positive relationship. This finding is most likely the result of maturation, meaning development budgets may increase every year regardless of the status of other revenue streams.

HEIs are focusing on increasing funding from gifts and grants; however revenues from these sources have generally remained at a consistent percentage of total revenue. While funding from gifts and grants totals have generally increased over the 11 years in the sample, the growth is not linear. Spikes in gift totals are impacted by “mega gifts” of \$5 million and above. These gifts do not occur regularly at most universities. In the sample, the only universities that may experience more consistent mega gifts are the flagship universities that are both RI Institutions and members of the AAU, they are University of Texas and Texas A & M University. These tremendous gifts create such an increase in giving that the following year will naturally result in a decrease. In this sample, 2014 was an outlier fundraising year and fundraising totals for Texas Public Institutions has not exceeded that total four years later (Table 7). The exceptional gifts create difficulty in comparing annual budget numbers and revenue streams to annual fundraising results.

A similar phenomenon can be seen with grants. Large federal grants are often awarded in one year but expended over multiple years, for example in 2013 in this sample (Table 8).

Faculty continually welcome additional funding, but often do not have the capacity or team size to execute several multi-million dollar federal grants simultaneously. Consequently, gift and grant funding is not a linear progression, and this path prevents clear association between inputs and outputs.

Table 7: Summary Statistics by Year, Private Gifts (x 1,000,000)

Year	Mean	Std. Dev.	Freq.
2008	32.49	86.90	33
2009	24.30	60.43	33
2010	27.75	77.93	36
2011	29.20	81.14	36
2012	30.19	76.56	36
2013	36.41	88.67	36
2014	56.36	166.96	36
2015	37.33	89.96	36
2016	35.69	90.20	36
2017	37.77	92.10	36
2018	44.00	109.77	36
Total	35.70	95.82	390

Table 8: Summary Statistics by Year, Government Grants (x 1,000,000)

Year	Mean	Std. Dev.	Freq.
2008	40.24	70.92	33
2009	44.46	72.22	33
2010	55.33	82.00	36
2011	57.33	83.23	36
2012	52.68	79.39	36
2013	56.53	86.92	36
2014	50.62	74.76	36
2015	52.01	77.98	36
2016	51.91	79.52	36
2017	55.21	86.18	36
2018	59.10	87.75	36
Total	52.46	79.46	390

## Conclusion

Organizations depend on external resources to meet their needs, and financial resources are one of the most crucial external sources impacting the success and longevity of an

organization. Revenue diversification can alleviate the dependence and decrease revenue volatility, should the revenue streams shift drastically or dissipate. This study found significant associations between decreases in state funding and increased revenue diversification and gift revenue. A relationship between declining state funding and grant revenue is supported, while development office budgets are not increasing because of state funding decreases.

Limitations to the study include sample size, endogeneity, maturation, and history threats. The limited sample size of 390 observations over eleven years can be overcome by including additional revenue data from previous years. Endogeneity occurs since the variables in the models are altered by their relationship with other variables within the model. The revenue sources are pieces of the same budget, and fluctuation in one source will affect the other sources. An extraordinary fundraising year will increase gift revenue percentage and in turn decrease state funding percentage. The values of the variables in this study can be determined by other variables in the system. Maturation of revenue sources is another threat, as budgets naturally increase over time as expenses also increase. This threat prevents an isolated study of development budgets since the majority of budgets increased annually. History is another internally validity threat, as many factors outside of the model impact funding from the state, private gifts, and government grants. Although Texas has the second-largest public HEI system in the country, mild external validity threats exist as results cannot be generalized across all states.

This study expands on existing literature on revenue diversification through an analysis conducted on HEIs. The author intends to explore the existence, extent, and impact of revenue diversification at HEIs. The analysis of the relationship between state funding and development

office budgets expands current research and deserves additional attention. HEIs can respond to decreasing support from the state by investing in their office responsible for bringing in external revenue sources from gifts and grants. This response is a resource within the control of university leadership and should be considered as the future of higher education funding is unpredictable. Development of this research stream should attempt to explain the changes in state funding and the effects of contributing factors. Why are revenue structures changing? Are universities responding to the changes in state funding or other factors? Expansion of this study should include an analysis of the impact of decreased state funding on higher education outputs. How will public universities change with the shift from state-funded to state-assisted institutions?

## **CHAPTER 3**

### **DETERMINANTS OF INDUSTRY ENGAGEMENT & SATISFACTION AT HIGHER EDUCATION INSTITUTIONS**

#### **Introduction**

Universities actively engage with various outside entities. Among all external influences and resources, industry may offer the broadest range of engagement opportunities. To name a few important roles, corporations serve as employers of graduates, benefactors, research collaborators, event sponsors, and vendors. The multifaceted resource exchange creates unique and dynamic partnerships impacted by annual changes on both the HEI and company side. Industry's profitability in a given year affects their level of philanthropic giving, the number of new college graduates they will hire, and the type of positions they will hire. University student quality, program offerings, and faculty expertise are continually shifting, leading to shifting themes of excellence that will attract and maintain corporate partners.

Industry engagement at higher education institutions (HEIs) is growing in depth and breadth. Companies are significant sources of philanthropic donations (Giving USA, 2018), hire more college graduates than any other category of employer (National Center for Education Statistics, 2018) and invest more money in research and development than all federal and state agencies combined (National Science Foundation, 2018). At the same time, industry funds account for only about 6% of academic R&D spending (National Science Foundation, 2018), and university corporate relations officers often report that intellectual property issues, prolonged contract negotiations, and a reluctance by companies to pay for university overhead costs make foundations or other funding sources easier to work with.

Within the multiple avenues of industry engagement, workforce development, and innovation through research activities are two corporate priorities that HEIs have the resources and talent to help realize. HEI's positively impact local human capital levels through talent production and academic research and development (R & D) activities. The exchange of assets between universities and industry create mutually beneficial partnerships reliant on resource dependence. Universities have resources that companies need, such as student talent, expert faculty, and knowledge. In return, industry can offer curriculum input, data, access to labs, and philanthropic and research funding. The mutually beneficial partnerships between industry and universities and exchange of resources are not fully understood in the existing literature. This study was designed to narrow the gaps in understanding between university and industry and to establish a benchmark for industry perspectives on issues of interest to university-corporate relations.

The majority of university-industry studies are conducted from the academic perspective. This study expands on existing research by analyzing the holistic partnerships between industry and universities from the industry perspective. Data collected via survey from corporate representatives inform the industry perspective and satisfaction levels regarding university partnerships.

Using Resource Dependence Theory as the theoretical framework, the resource exchange between industry and HEIs is studied. Utilizing data collected via a survey of corporate employees involved in university partnerships, multiple relationship-building factors are analyzed regarding their impact on industry partner satisfaction. Five key determinants of industry engagement at universities are measured: (1) having a dedicated university relations

manager, (2), measurements of return on investment, (3) a single point of contact at university partners, (4) company goals for university engagement, and (5) criteria used to select university partners. Following the survey, selected survey respondents also participated in individual follow-up phone interviews that explored topics in greater depth. Industry participants in both the survey and the follow-up calls represented multiple job functions at a variety of company industries and sizes. Results show significant positive relationships between all independent variables and industry partner satisfaction except for quantitative measurements of return on investment. These findings contribute to growing literature on industry-university engagement by identifying key determinants that impact industry partner satisfaction.

### **Corporate Engagement at Higher Education Institutions**

Industry's presence on campus spans multiple avenues, each with goals relating to the company's mission. Companies engage with HEIs to recruit top talent, invest corporate social responsibility resources, build brand awareness, encourage business development, and partner with faculty on research and product development (Walter and Watts, 2019). Companies also recognize that their support of universities also affects their local economy. Metropolitan areas with more higher education activity produce a larger share of workers in high human capital occupations (Abel and Deitz, 2011). These undertakings have led to universities are becoming more involved in economic development and have the power to reinvigorate metropolitan areas. Abel and Deitz concluded that their research indicates that HEI activity can impact human capital by raising the supply and the demand for skills.

Companies support HEI's through philanthropic gifts that further the university mission, increase levels of faculty excellence, and remove financial barriers for students through

scholarships. Beyond philanthropic funding, corporate engagement on campus is a valuable resource. Industry input assists in keeping curriculum current and producing work-ready graduates (Walter and Watts, 2019). A European-wide study of HEIs showed a positive relationship between senior leadership engagement and alumni networks on industry engagement in curriculum design (Plewa, Galán-Muros, & Davey, 2015). The study also found these increased levels of engagement lead to increased alignment in curriculum meeting company needs. Companies participate on Advisory Councils that share ideas with the Deans and academic leadership of a university, school or department. Industry partners enhance the educational experience by providing real-world challenges for students to apply what they have learned in the classroom (Clevenger, 2014). These student enrichment opportunities occur inside and outside of the classroom. Among many engagements, company representatives speak to classes, provide challenges for student projects and sponsor business idea competitions to the benefit of the university and students (Clevenger, 2014; Walter and Watts, 2019).

A mutually beneficial partnership is formed when companies both actively engage on campus through their resources, including time, human capital, talent, and also financially support the university (Walter and Watts, 2019). On both the HEI side and corporate side, multiple functions serve to support their organization's mission. On the HEI side, senior leadership, deans, researchers, center directors, and development staff manage their respective functions to support the advancement of their university's mission. Harmoniously, in industry, senior leadership, researchers, program managers, and corporate social responsibility teams also desire external partnerships to support company goals (Clevenger & MacGregor, 2016).

Companies are becoming increasingly strategic with their approach to working with universities (Bercovitz and Feldman, 2007) and while measuring the success of these partnerships can be difficult (Perkman et al., 2011). The majority of HEIs employ corporate relations officers whose goal is to build industry partnerships. These staff may be housed in an official corporate relations office, or as the single staff member on a university campus. Corporate relations office functions range in size, structure, and influence, have models that are centralized or decentralized across campus (Clevenger, 2014; McCoy, 2011). A corporate relations office initiates conversations with potential corporate partners and maintains and strengthens existing industry-university partnerships. The engagement strategy is similar for both new and existing partners: the corporate relations office assists industry in exploring connections across campus and accessing aligned resources for mutual benefit. Corporate Relations Officers develop mutually beneficial engagements between their university and industry.

### **Network of Academic Corporate Relations Officers**

Founded in 2007, the Network of Academic Corporate Relations Officers (NACRO) serves the professional development and continuing education needs of academic, corporate relations officers. NACRO conferences, workshops, and webinars create a network to share ideas and best practices and learn from colleagues around the globe.

According to the NACRO, “The long term goal of NACRO and its membership is to engage industry in a setting that allows for open discussion while sharing best practices with peers. As corporate philanthropy and R&D evolves towards increasingly collaborative activities, NACRO will aid in defining these roles. As corporations expand globally but work locally, they

seek the “front door” to an academic institution that a university corporate relations office can provide” (NACRO, 2019).

Initially, to join NACRO, members were required to spend a minimum of 50% of their time on corporate relations and be employed at a research university as defined by the Carnegie Classification. In 2017, NACRO implemented a new strategic plan that opened up membership to all individuals who work in or are interested in learning more about corporate relations and industry-university partnerships. In addition to academia, the diversified membership will now include members from industry, government, and nonprofit organizations that work to create mutually beneficial partnerships (NACRO, 2019).

NACRO is a volunteer-led organization, with one contracted administrative services manager on the payroll. Five committees conduct complementary work to ensure NACRO’s existence, produce premier professional development offerings, and create a collaborative member experience. Utilizing the power of volunteers and led by the NACRO Board of Directors, the following committees comprise the organization: Benchmarking, Conference Programming, Finance, Marketing & Communications, Membership & Alliances, Professional Development, and Site Selection. This dissertation utilizes the work of the Benchmarking Committee.

Since 2011, NACRO’s Benchmarking Committee has published a series of white papers that collectively provide guidance and best practices around university-industry engagement. Past NACRO Publications include Five Essential Elements for a Successful Twenty-First Century Corporate Relations Office, Metrics for a Successful Twenty-First Century Academic Corporate Relations Program and Engagement of Academic Corporate Relations Officers in University-

Industry Centers of Research Excellence. While exploring different aspects of university-industry engagement, the papers are primarily from the viewpoint of the university. The 2019 NACRO Industry Survey examined the corporate perspective on the relationship. As part of the NACRO Benchmarking Committee, an Industry Perspective Subcommittee began working on information gathering and data collection efforts in 2017. The purpose of the Industry Survey is to provide NACRO members, as well as the field and industry partners, with actionable insights that can lead to better understanding, organizational decision-making, and realistic expectations about goals and priorities of each party in an academic-corporate relationship.

This study utilizes data collected via 23 questions in NACRO's 2019 Industry Survey, as well as a series of subsequent interviews with industry representatives who are responsible for aspects of university relations that range from recruiting, to research partnerships, to overall relationship management.

### **Resource Dependence Theory**

This study is grounded in Resource Dependence Theory (RDT). The varying needs for a multitude of resources make organizations dependent on the external sources of these resources. Consistent interaction between organizations is necessary if the purpose of the engagements is to develop mutually beneficial partnerships (Clevenger, 2014; Clevenger & MacGregor, 2016; Pfeffer & Salancik, 2003). Industry and HEI's experience a unique inter-organizational exchange concerning resources. Companies are continually seeking one of the top products of HEIs: new graduates. Simultaneously, universities seek multiple resources from companies, including financial investments, research collaborations, and access to data.

This exchange of resources creates an inter-organizational dependence with shifts in power control. The fundamentals of RDT are based on power. Within RDT, the sources of power and dependence are studied, as well as how they are managed and the consequence of each in an organization. (Pfeffer and Salancik, 2003). Power and dependence are obverse of each other, but organizations can also be interdependent and have control over each other. RDT assumes that the dependence on critical resources influences the actions of and decisions made by an organization (Nienhüser, 2008). RDT recognizes that the influence of external factors on the behavior of organizations, and although constrained by resources, managers can take action to reduce the uncertainty (Hillman et al., 2009).

As detailed in Chapter 1, Pfeffer and Salancik describe the framework of the theory as focusing on the environment, control of power, executive succession, and feedback effects. The environment is a source of constraint and uncertainty for an organization. RDT considers the process of gaining resources from the external environment. It is essential first to understand which resources are considered critical to an organization. The criticality of resources measures the ability of an organization to function in the absence of the resources (Pfeffer and Salancik, 2003). The concentration of resources means the concentration of power. The distribution of power in the environment influences an organization. A central tenet of RDT is whoever controls the resources has power over the actors that need the resources (Nienhüser, 2008). RDT also stresses that organizations exchange resources with their environment as a condition for survival. Organizations are dependent on external resources, but an interdependent relationship can also exist.

An interdependent relationship exists between organizations when they are dependent on each other for resources. Such a relationship exists between corporations and universities. Businesses and universities exchange a valuable resource in students that graduate and become employees. Companies desire an educated workforce and seek a quality pipeline of future employees. Universities have multiple customers, but the primary customer is the student. Students pay tuition for the services they receive in the form of education. Universities educate students, and upon graduation, they become a resource to corporations.

Relationships between industry and HEIs are dynamic. Corporations differ from each other in desired resources from a partnership with an academic institution, and their needs may change over time as well. For example, if a company is focused on recruiting, its academic relations representatives will want to engage a colleague knowledgeable about graduation rates, alumni information, and participated in ways to promote their company's brand to students. If a company wants to influence curriculum to address perceived gaps in skills or knowledge among new hires, their best resource is academic conversations is a faculty member (Garber & Watts, 2019). If the company is focused on research, the scientific staff or academic relations manager is concerned with the resource of intellectual property. These are a few examples of resource exchanges occurring in industry-university partnerships. This study is grounded in the resource exchange between HEIs and corporations.

### **Research Questions**

All organizations, both public and private, depend on external resources to meet their needs. RDT assumes that the dependence on such critical resources influences the actions of and decisions made by an organization. In addition to the industry-university resource exchange, it is

crucial to understand the structure of how a company assesses university partnerships. Industry assessment strategies of university partners include selection criteria, goals for university engagement, and calculation of return on investment from the partnership. An increased emphasis placed on selection criteria, partnership goals, and measurements of ROI with university partners demonstrates intentionality when building alliances (Garber & Watts, 2019). The intentionality of engagement goals and partner selection criteria is expected to enhance the quality of partnerships and in turn, increase industry partner satisfaction.

Academic engagement goals: Drive commercialization, Encourage staff development, Fund applied research, Increase sales, Support basic research in relevant areas, Support Corporate Social Responsibility, Build brand awareness, and Recruit grads for employment.

Partnership selection criteria: Distance education programs offered, Exclusivity (existing partnerships with competitors), Executives who are alumni, Number of current employees who are alumni, Flexibility of university's intellectual property policy, Current/recent company research support, Proximity of university to headquarters or facilities, Existing faculty/administrators relationships, University's track record for managing industry relationships, University research aligned w/product roadmap and Alignment of degrees with recruitment goals.

This study also analyzes the impact of two resources involved in the organizational partnerships: having a dedicated university relations manager on the company side and a single point of contact on the university side. Dedicated staff to manage either side of the partnership is expected to increase industry partner satisfaction.

This study tests the following hypotheses:

*H<sub>1</sub> Having a dedicated university relations manager has a positive relationship with partnership satisfaction.*

*H<sub>2</sub> Quantitative measurements of return on investment with university partners have a positive relationship with partnership satisfaction.*

*H<sub>3</sub> A single point of contact at a university has a positive relationship with partnership satisfaction.*

*H<sub>4</sub> The number of extremely important company goals for university engagement has a positive relationship with partnership satisfaction.*

*H<sub>5</sub> The number of extremely important criteria used to select university partners has a positive relationship with partnership satisfaction.*

## **Data & Methodology**

Data collected via a survey informs this study. The global organization, NACRO, administered their Industry Survey in spring 2019. The survey target population included industry employees in roles affiliated with university engagement. Example job titles for the target population include University Relations Manager, Research and Development Manager, Campus Recruiter, Community Relations Manager, and Philanthropy Manager, among others. The survey invitation list was a combination of several inputs: industry contact names submitted by NACRO members, target population titles collected from data.com and LinkedIn and additional solicitations issued by NACRO members who elected not to share the identities of their invitees. The survey invitation was sent to 600 individuals in the target population, with a goal of 100 responses. NACRO received 152 survey responses between January 18, 2019, and April 10, 2019. Three respondents were removed from the dataset because they are employed by HEIs and

erroneously completed the survey. The final number of respondents is 149. The sample is representative and is an appropriate size given the target population.

The survey did not include questions with mandated responses in order to complete the survey. Excluding two administrative questions, the average response rate per question was 95%. Respondents provided an average of 16 comments on 18 questions that allowed room for text comments or additional explanations. A text-only question that prompted respondents to identify areas for improvement in university-industry relations received 46 responses, representing 30.8% of respondents. Following the survey, 22 respondents were selected for subsequent one-hour individual interviews. Of the 22 invitations extended, 16 industry representatives participated in the interviews that explored topics in greater depth. Respondent interviews were recorded via summaries completed from meeting notes. Industry participants in both the survey and the follow-up calls represented a variety of company sizes and job roles that included external research coordination, recruiting, and relationship management. Supplementary interviews conducted via videoconference or phone in April and May 2019 lasted 30-60 minutes. The interview candidate population was identified based on a positive response to a survey question asking if they would be willing to participate in such an interview. From the self-selected interview candidate population, and with a goal of diverse industry sector representation, invitations were extended to individuals that provided insightful comments on open-ended survey questions.

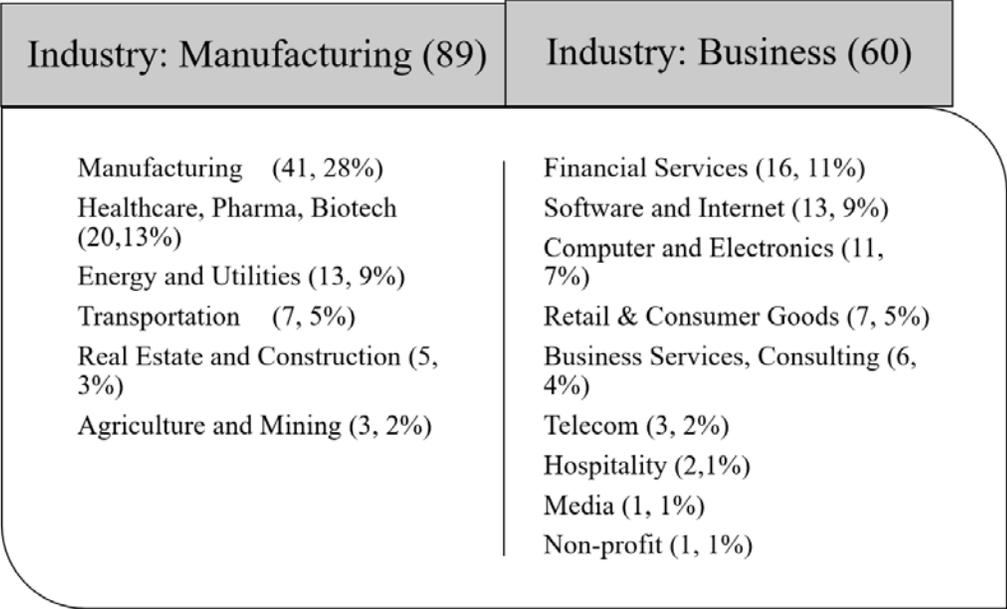


Figure 4: Respondent Industry and Index

The majority of survey respondents work for public companies (73%) with at least \$1 billion in annual revenue (73%). Many of the companies represented in the survey are global, but all have North American operations. The sample is representative across 15 different industries. The majority of survey respondents work in Manufacturing (26%), Healthcare, Pharmaceuticals, and Biotech (13%) and Financial Services (11%) (Figure 4).

Survey respondents primarily work in three categories of job functions: Research & Product Development (38%), Human Resources (31%), and Corporate Social Responsibility (15%). The respondent position is converted to a dichotomous variable of Technical and Non-Technical (Table 9).

Table 9: Respondent's Position

Position	Number	Percentage	Technical
Human Resources/Talent Acquisition	27	18%	N
University Relations Team within HR	19	13%	N
Research & Product Development	57	38%	Y
Corporate Social Responsibility/Community Relations	23	15%	N
Business Development	19	13%	N
Passionate alumni working on University Partnerships beyond the day job	4	3%	N
Total responses	149	100%	

This study is primarily interested in how certain factors of industry-university engagement affects industry satisfaction with their university partners. The dependent variable is industry partner satisfaction. This variable is measured on a scale from 0-100. Respondents were asked, "How satisfied is your company with university partnerships?" The descriptive analysis of the dependent variables finds that industry satisfaction ranges from 28 to 100 (Table 10). The mean satisfaction is 65.7, with a standard deviation of 17.9. The satisfaction ratings with the most answers were 50 (21 responses), 51 (10 responses), 69 (6 responses), and 94 (6 responses).

There are five observed independent variables: (1) a university relations manager at the company, (2), quantitative measures of return on investment, (3) preferring a single point of

contact at a university, (4) company goals for university engagement, and (5) criteria used to select university partners.

The descriptive analysis on the independent variables finds the majority of companies represented in the survey have a dedicated university relations manager (60.7%), do not use quantitative measures of return on investment (58.1%) and prefer having a single point of contact at a university (54.8%) (Table 10).

Table 10: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Satisfaction	140	65.72	17.91	28	100
ROI Measurements (Y) = 1	148	0.42	0.50	0	1
University Relations Manager (Y) = 1	135	0.61	0.49	0	1
Single Point of Contact (Y) = 1	146	0.55	0.49	0	1
Important Criteria for Selecting Academic Partners	149	2.54	1.64	0	7
Important Goals for Academic Engagement	149	3.55	2.03	0	8
Respondent Industry, Manufacturing (Y) = 1	146	0.60	0.49	0	1
Respondent Position, Non-Technical (Y) = 1	146	0.62	0.49	0	1
Public Company (Y=1)	149	0.73	0.44	0	1
Corporate Revenue > \$1 billion (Y=1)	147	0.79	0.41	0	1

Regarding goals for university engagement, respondents ranked eight goals on a scale of

1 to 5, ranging from Not Important (1) to Extremely Important (5). The variable used in this study for engagement goals is the number of extremely important goals. Summary statistics on engagement goals find a range of 0 to 8, a mean of 3.55 goals ranked Extremely Important and a standard deviation of 2.03. Engagement goals were most frequently ranked extremely important two times (20.81 percent), three times (17.45 percent), four times (16.78 percent) and five times (13.42 percent) (Table 11).

Table 11: Summary Statistics: Important Goals for Academic Engagement

Goals for Academic Engagement	Frequency	Percent	Cumulative
0	8	5.37	5.37
1	13	8.72	14.09
2	31	20.81	34.90
3	26	17.45	52.35
4	25	16.78	69.13
5	20	13.42	82.55
6	13	8.72	91.27
7	5	3.36	94.63
8	8	5.37	100.00
Total	149	100	

Similarly, for criteria used to select university partners, respondents ranked seven criteria on a scale of 1 to 5, ranging from Not Important (1) to Extremely Important (5). The variable used in this study for selection criteria is the number of criteria ranked as extremely important. Summary statistics on engagement goals find a range of 0 to 7, a mean of 2.54 criteria ranked Extremely Important and a standard deviation of 1.65. Criteria were most frequently ranked

extremely important one time (24.16 percent), two times (22.82 percent), and three times (18.12) (Table 12).

Table 12: Summary Statistics: Important Criteria for Selecting Higher Education Partners

Criteria for Selecting HEI Partners	Frequency	Percent	Cumulative
0	11	7.38	7.38
1	36	24.16	31.54
2	34	22.83	54.37
3	27	18.12	72.49
4	20	13.42	85.91
5	15	10.07	95.98
6	3	2.01	97.99
7	3	2.01	100.00
Total	149	100	

Control variables include (1) position, (2) company industry, (3) company revenue, and (4) private or public organization type. Control variables are naturally dichotomous or were converted to dichotomous variables for this study. The respondent’s job position is condensed into technical (Research & Product Development) and nontechnical job functions (Human Resources and Corporate Social Responsibility). Company industries are categorized into two variables: manufacturing and business.

## Findings

This research analyzes critical elements of industry-university engagement and the impact on industry satisfaction with university partners. The model is estimated using regression analysis. This study finds a positive relationship between selected predictors and industry satisfaction. Four of the five findings are significant.

Regression analyses are conducted on each independent variable separately and in one combined model. The study finds a significant relationship ( $p < 0.05$ ) between having a dedicated university relations manager and industry satisfaction. The coefficient is positive and significant; having a dedicated university relations manager increases industry satisfaction by an average of 6.943 percentage points (Table 13).

Table 13: Regression Analysis: (Separate Models)

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5
<b>INDUSTRY PARTNER SATISFACTION</b>					
University Relations Manager (Y=1)	6.943** (3.339)				
ROI Measurement (Y=1)		1.859 (3.278)			
Single POC (Y=1)			6.371** (3.142)		
Total Academic Goals				2.064*** (0.750)	
Total Selection Criteria					1.940** (0.929)
Non-Technical Position (Y=1)	2.892 (3.327)	3.439 (3.241)	3.198 (3.164)	1.928 (3.242)	4.301 (3.097)
Manufacturing (Y=1)	0.660 (3.379)	-0.611 (3.241)	-1.666 (3.185)	-0.386 (3.137)	-1.502 (3.220)
Revenue > than \$1b (Y=1)	1.192 (4.673)	3.976 (4.214)	4.333 (4.145)	3.484 (4.011)	2.718 (4.088)
Public Company (Y=1)	0.965 (4.324)	0.628 (3.934)	-0.445 (4.019)	-0.963 (3.813)	2.162 (3.760)
Constant	57.56*** (4.735)	59.43*** (4.305)	57.99*** (4.590)	55.24*** (4.189)	55.13*** (4.464)
Observations	125	138	137	138	138
R-squared	0.052	0.025	0.052	0.072	0.051

Robust standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

As seen in Model 2, the number of extremely important goals a company has for university engagement has a significant positive relationship with satisfaction ( $p < 0.001$ ). For every increase in the number of extremely important goals, industry satisfaction increases by 2.064 percentage points. The analysis of selection criteria also has significant positive results. The number of extremely important selection criteria significantly ( $p < 0.05$ ) and positively impact satisfaction. Each increase in the number of important criteria increases partner satisfaction by 1.940 percentage points (Table 13).

The fourth analysis observed the impact of a company implementing quantitative measures of return on investment. Quantitative measurement of return on investment has a positive impact on satisfaction, increasing satisfaction by 1.859 percentage points, but the relationship is not significant. Model 5 examines the respondents' preference for a single point of contact at a university. Having a single point of contact at a university has a significant relationship ( $p < 0.05$ ) with industry satisfaction, increasing satisfaction by 6.371 percentage points (Table 13).

When the effect of all the independent variables is run in the same model, the significance of findings is lost with two variables. As seen in Table 14, having a University Relations Manager loses a degree of significance, but is still a significant positive effect of 6.585 increase in industry partner satisfaction ( $p < 0.1$ ). A single point of contact remains significant and positive, increasing industry partner satisfaction by 7.116 points ( $p < 0.05$ ). In this model, quantitative measurements of ROI now has a negative effect on satisfaction, decreasing satisfaction by 0.850 percentage points.

The number of extremely important goals a company has for university engagement maintains a significant positive relationship with satisfaction ( $p < 0.05$ ). For every increase in the number of extremely important goals, industry satisfaction increases by 1.755 percentage points. The last analysis of selection criteria retains positive results but loses significance. Each increase in the number of extremely important selection criteria positively affects satisfaction with an increase of 1.064 percentage points (Table 14).

Table 14: Regression Analysis: (Aggregate Model)

INDUSTRY PARTNER SATISFACTION	(1) Model 6
University Relations Manager (Y=1)	6.585* (3.359)
Single Point of Contact (Y=1)	7.116** (3.196)
ROI (Y=1)	-0.850 (3.377)
Total Academic Goals	1.755** (0.824)
Total Selection Criteria	1.064 (0.952)
Non-Technical Position (Y=1)	1.147 (3.592)
Manufacturing Industry (Y=1)	0.409 (1.122)
Revenue > than \$1b (Y=1)	0.443 (4.307)
Public Company (Y=1)	1.154 (4.140)
Constant	49.39*** (5.010)
Observations	125
R-squared	0.141

Robust standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## **Context Themes**

Following the survey, the NACRO survey committee selected 22 respondents for the subsequent one - hour individual interviews. Of the 22 invitations extended, 16 industry representatives participated in the interviews. The interviews provide additional context on the industry perspective on university partnerships and have practical implications for HEIs. Four themes are derived from the respondents' conversation and comments on industry-university engagement:

Theme 1: Develop a Single Point of Contact for Industry-University Relations

Theme 2: Acknowledge and Understand University Strengths and Gaps

Theme 3: Understand the Organizational Power Balance

Theme 4: Enrich University Value Proposition with Relevant Tools and Data

### ***Theme 1: Develop a Single Point of Contact for Industry-University Relations***

As noted earlier, a majority of survey respondents found a single point of contact at a university to be desirable. Universities often call this staff person the corporate relations officer. The corporate relations officer should be a knowledgeable facilitator and communicator versus a gatekeeper. Corporations seeking a relationship with a university can find the decentralized nature of research institutions to be confusing and intimidating. A corporate relations officer who responds promptly to phone calls and emails, follows up meetings with clear next steps, and has a detailed understanding of their institution can be vital to establishing or strengthening a relationship (Garber & Watts, 2019).

The corporate relations officer serves as a connector and coordinator on campus, versus a roadblock or funnel that may slow down engagements. Industry does not always have a corresponding single point of contact counterpart. While larger companies may have a high-ranking manager with a broad view of university relations, the majority of industry contacts have a narrower focus on faculty research, on student recruiting, or philanthropic donations. The level of communication within a company varies widely. For example, company research leads will often identify top talent from student projects to their colleagues responsible for recruiting, and recruiting leads may suggest gift opportunities to the philanthropic team, but single company contacts are not necessarily knowledgeable about the full breadth of engagements at each partner university.

Industry contacts know theirs is not the only company that a university's corporate relations staff is managing, but they prefer to be treated as such. This insight suggests prioritizing quality over quantity when developing a portfolio of company partners and potential partners (Garber & Watts, 2019). Several interview respondents emphasized that universities can be complicated and confusing to outsiders. The corporate relations officer is crucial to translating between the languages and cultures of industry and academia, as well as serving as an advocate for corporate partners on their university campus (Garber and Watts, 2019). The person in this liaison role does not need to be a subject matter expert, although some experience working in industry was referenced as helpful in interviews. Industry respondents find that institutional knowledge is more important than technical expertise. For example, the corporate relations officer should be able to share information on young faculty working in a given field and know the appropriate contacts for industry engagement across campus. Finally, industry respondents expressed the opinion that

corporate relations officers should serve as advocates for company partners at their university, as opposed to the other way around.

***Theme 2: Acknowledge and Understand University Strengths and Gaps***

Industry professionals managing HEIs partnerships appreciate open, honest relationships, as well as a wealth of information regarding university offerings. Industry interviewees expressed frustration when the corporate relations officer fails to identify evidence bases areas of research excellence at their institution, as well as failing to acknowledge gaps in university offerings. Universities are home to multiple colleges, centers of excellence and entrepreneurial faculty working on their research. Often, HEIs evade selecting a few areas of excellence to promote to avoid alienating faculty research outside of the chosen areas. However, companies know, as universities do as well, that a single HEI can not be “best in class” in all disciplines. It is essential, and advantageous to building corporate partnerships, for universities to communicate specific strengths and points of pride. According to industry, building a new relationship with a university is a cost and a resource-intensive process. For companies to commit time to a new university, the resources offered and benefit should be crystal-clear (Garber & Watts, 2019).

Corporate Relations Officers can devote the time and necessary resources to understand each corporate partner deeply. By knowing their product and service offerings, their priorities, and their strategies, universities can create tailored engagement strategies for industry. In the survey and interviews, it was clear that industry respondents desire information that can address their specific needs. Universities cannot assume that a company is all-knowing about the resources offered by the institution. Effective academic corporate relations staff are as dynamic as the

partnership; they respond to changing requirements and adjust engagement plans to meet industry priorities (Garber and Watts, 2019).

### ***Theme 3: Understand the Organizational Power Balance***

The distribution of power in the environment influences an organization. It is essential to understand the power balance in each university-industry relationship. Resource Dependence Theory contends that those with control of resources have the power over the actors that need the resources (Nienhüser, 2008). It is realistic to consider if the HEI or company needs the partnership more.

Regarding recruiting top talent, universities producing demonstrably qualified graduates in an in-demand field are producing a highly valued resource. In this scenario, universities hold power. Companies realize and accept the need to pay for preferred access to those students, résumés, and to receive privileged placement at recruiting events (Garber & Watts, 2019). Examples of these roles in the current job market include data analysts, data scientists, artificial intelligence/machine learning graduates, as well as petroleum engineers and systems engineers. Highly specialized roles also result in an increased willingness to pay for access to limited graduate supply. For example, companies hiring petroleum engineers are aware that the number of HEIs with petroleum engineering programs is limited.

In addition to talent, research and innovation are resources that industry seeks from universities. Companies may be willing to build an entire partnership around the opportunity to

work with a specific faculty researcher with unique knowledge or skills that can be applied to a company problem of importance or the company's product roadmap.

***Theme 4: Enrich University Value Proposition with Relevant Tools and Data***

Company contacts desire tools and data to assist in establishing and maintaining academic partnerships. Corporate relations officers have the opportunity to impress potential or current partners through researching information and news releases on companies to inform their engagement strategies. Understanding the company's mission, products, and most recent developments through news channels demonstrates a commitment to meeting partner needs (Garber & Watts, 2019). Examples of deliverables to communicate the academic resources available include a university database, relationship management tools, and data tracking to calculate ROI. First, HEIs can create and maintain a database of university contacts for industry, including organization charts, faculty lists with research specialties, recent publications, and grant awards. This effort should align faculty strengths with information about a company's mission, product development roadmap, or hiring needs. Information should be communicated through concise, graphics-driven, user-friendly data on university rankings, faculty and student awards and prizes, and specialized equipment or facilities.

Second, industry interviewees desire relationship management tools to coordinate and capture their engagements on the university campus. Specific examples shared in interviews include an annual partnership report, an activity-tracking tool to manage the entire relationship, intentional agendas for campus visits, data on interns placed with the company, or data on university alumni. Several survey respondents mentioned the need to be aware of a corporate

executive's campus visit to maximize their time and effort. When aware of the planned executive visit, industry campus relations staff can plan other engagements at the university to expand beyond a single event or speaking to one class. Third, similar to companies reported on performance to shareholders, industry expects to calculate its ROI from a university relationship. University staff have the opportunity to propose metrics, benchmarking data, and data resources to companies. Examples of metrics include interns hired by the company, interns converted to full-time staff, the three-year retention rate of university graduates, number of student capstone projects sponsored, number and amount of research contracts, and numbers of patents, papers, IP licenses, or Technology Transfer Agreements.

## **Discussion**

Multiple aspects of a partnership affect satisfaction between parties. Overall, industry representatives rated their satisfaction with academic relationships as 65 out of 100. This score suggests there is room for improvement. This study finds several determinants that impact company satisfaction in industry-university partnerships.

First, having a dedicated university relations manager significantly improves partner satisfaction by 6.9 (Model 1, ( $p < 0.05$ )) and 6.6 (Model 6, ( $* p < 0.1$ )) percentage points. This finding suggests that investing in a university relations manager is a good use of company resources. Responsibilities for academic relations may reside in several different departments at a company. Company interactions with universities are conducted through separate departments, which creates silos of information and access. Industry - university engagement primarily occurs through human resources, corporate social responsibility, or R & D departments. Often, corporate social responsibility and philanthropic efforts are disconnected from recruiting and

research collaborations. The scope of a university relations manager spans these and other departments to manage a comprehensive partnership with a university. This holistic level of understanding leads to the strategic use of company resources and facilitates stronger partnerships. The increase in satisfaction suggests that having a dedicated university relations manager positively influences the quality of university-industry partnerships.

Second, having a single point of contact at a university has a consistent significant positive impact on partner satisfaction. A single point of contact at a university significantly improves partner satisfaction by 6.4 (Model 5) and 7.1 (Model 6) percentage points. A single point of contact facilitates the industry-university relationship, streamlines communications, and coordinates engagement with universities. This significant positive impact of a single contact reinforces a fundamental tenet of holistic university corporate relations. Universities are complicated, hierarchical, and move at a slower pace than industry. Having a single point of contact to assist industry in navigating a university improves the speed, quality, and consistency of business engagement on campus. This finding aligns with the engagement model promoted by global corporate relations organization NACRO. The single point of contact is often called an academic corporate relations officer. This single point of contact can be a differentiator in partnership decisions, and industry-academic relations representatives believe that corporate relations staff should represent their interests at the university, not (only) the reverse. Industry respondents shared ample amounts of respect and appreciation for the hard work done by corporate relations staff. At the same time, there is an expectation that industry priorities will be articulated and advocated for on campus by the corporate relations staff.

Next, both academic engagement goals and partner selection criteria have a significant positive impact on industry satisfaction. Although a smaller effect at 2.1 percentage points, goals for academic engagement had the most significant ( $p < 0.01$ ) finding (Model 2) in the study. Established goals for university partner engagement impact the quality of the relationship and in turn, are demonstrated to be essential for industry satisfaction. Partner selection criteria positively impact industry satisfaction, although the finding is significant when run independently (Model 3). Selection criteria guides where, how, and why a company will invest its resources of time, talent, and treasure (financial support). This finding suggests that the intentionality of selection criteria results in the sound use of company assets and higher quality partnerships. Establishing goals and selection criteria require time, internal alignment, and support from company leadership. Overall, these findings suggest that the investment of company resources to develop and abide by goals and criteria are justifiable.

With additional insight gathered through the 16 interviews with survey respondents, four context themes were derived to inform universities on how to enhance industry partnerships. These best practices can be implemented to improve industry satisfaction.

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Additionally, the survey included specific opportunities for universities to improve. The most frequently cited opportunities for improvement focused on processes, partner information exchange, and students. First, industry desires improvements to contract procedures, including Intellectual Property policies and tightened internal processes (especially communication). Companies also crave more information exchange regarding the partnership. Respondents crave a clear articulation of the value and benefits of a relationship to corporate partners, and they want the university to demonstrate knowledge and understanding of the strategies and goals of the company. Industry values relationship data and partnership tools. Respondents are incredibly appreciative of information in areas such as new faculty hires, joint funding opportunities, and opportunities to participate in relevant campus activities. Companies are also interested in comprehensive data on their partnership with an institution. This effort can include regular updates on the status of the relationship, such as an annual summary. Companies reported that they do not typically have tools to evaluate their academic partnerships; this is a gap that universities can fill. Last, industry wants prepared students for the recruiting process and the realities of the workplace. Universities can dramatically assist companies by increasing their efforts to equip new graduates for the transition from student to a full-time employee.

There are limitations to this study. The lack of theoretical framework makes it difficult to generalize results to all companies and replicate these research results. Several internal validity threats exist.

Regarding selection, this dataset includes responses from individuals that chose to participate in the survey. Therefore, the sample includes respondents that may be more likely to have higher satisfaction levels. The majority of respondents were individuals invited to complete

the survey by their university counterpart. This invitation could have created bias in the answers provided by respondents. Also, the current data set does not include data on the amount of philanthropic or research funding companies invested in their partner universities. While satisfaction is an important measure, this data set is not able to connect engagement to financial investment with university partners.

The survey data set is representative given the target population. The respondents have a variety of job functions within companies and represent a wide-ranging cross-section of North American businesses, many with global operations. Generalization of results should be reviewed with caution as additional, larger sample sizes are needed for additional analysis. Distinct themes emerged from the survey data, follow up conversations, and this study's analysis. Ultimately, a university-industry engagement consists of relationships between people representing unique organizations. Partnerships involve an exchange of resources for mutual benefit. These resources include time, talent, money, negotiation, performance, and accountability. Partnerships are dynamic and evolve.

## **Conclusion**

This chapter provides insight into the determinants of industry engagement at HEI partners and satisfaction with university partners. Respondents from a broad cross-section of industry sectors shared their views through new data collection conducted via survey. This research had a distinct focus on (1) a university relations manager at the company, (2), quantitative measures of return on investment, (3) a single point of contact at a university, (4) company goals for university engagement, and (5) criteria used to select university partners. This

study found significant relationships with four of the five variables and will be expanded through further research to strengthen the significance of the findings.

This study has practical implications for both industry and university. In line with Resource Dependence Theory, several decisions made by industry have a positive feedback effect on their organization. The increased effort of having academic engagement goals and selection criteria for university partners demonstrates intentionality when building university partnerships. This intentionality was expected to, and confirmed to, result in increased quality of partnerships and in turn, increased partnership satisfaction. These findings suggest that companies should invest time in establishing academic engagement goals and university partner selection criteria.

The study also reinforces the value of relationship managers on both the industry and the university side. Industry ought to have a dedicated university relations manager to coordinate HEI partnerships across multiple departments. Concurrently, industry benefits from having a single point of contact on the university side to manage a comprehensive partnership. The single point of contact serves as a master coordinator of all the engagements on campus. Having a single point of contact within a partnership does not inhibit, rather it enhances, the multiple discussions transpiring between the company and university. The survey revealed that modern, decentralized research universities could be complicated and confusing to outsiders. This finding reinforces the role of the single point of contact, also known as dedicated corporate relations staff, and suggests that a centralized corporate relations office can effectively coordinate industry engagement across departments and schools. While acknowledging the complexity of a modern academic institution, industry expects corporate relations staff to be informed and responsive.

Partnerships inevitably rely on relationships and trust between individuals, attention to detail, and communication skills make a real difference in successful relationships. These factors are within the control of industry leadership and can be implemented to improve the quality of relationships and in turn, industry satisfaction with university partners.

This study on industry perspectives on university partnerships has provided a long-needed baseline of information that will be expanded in future work. The current research effort includes the first survey, to the author's knowledge, assessing the industry perspective on industry-university relationships and their satisfaction. The survey ought to be conducted over multiple years to assess longitudinal results. Additional research will be conducted via subsequent surveys, and by conducting case studies of industry-university partnerships. Overall, industry respondents respect and appreciate the partnerships with industry and the work done by corporate relations staff. Industry counterparts value an advocate on the university campus that understands and represents their interests. This study confirms that corporations value their academic relationships, but with an expected demonstrable return from their investments, there is much room for improvement in regards to industry satisfaction.

## CHAPTER 4

### THE EFFECT OF ORGANIZATIONAL FACTORS ON UNIVERSITY-INDUSTRY PARTNERSHIPS

#### Introduction

Education and the success of the economy, at all levels, are interdependent. Colleges and universities play an integral role in the success of our country and world through the students they educate and the innovation they foster. The rising cost for HEIs to provide quality education, and in turn, the increasing cost of college tuition, receive increasing scrutiny. HEIs look to external partners to provide services, input, and funding to assist in providing a quality education for students. Regarding funding, decreases in public funding have resulted in HEIs looking to external donors to fill the gap. External donors include individuals such as alumni, private and public foundations, and corporations.

Workforce development and innovation are priorities for companies, and HEIs have the resources and talent to meet these industry needs. The exchange of assets between universities and industry create mutually beneficial partnerships reliant on resource dependence. Universities have resources that companies need, such as student talent, expert faculty, and knowledge. In return, industry representatives can offer curriculum input, data, access to labs, and philanthropic and research funding (Walter & Watts, 2019). This study analyzes the mutually beneficial partnerships between industry and universities through the academic lens.

The majority of research in fundraising focuses on individual giving, and within the context of higher education, alumni giving has been studied. Some research has expanded to corporate giving and engagement with nonprofit organizations. Regarding industry engagement

at universities, an increasing amount of research is focusing on understanding the exchange of research and technology transfer. While critical, research engagement is one piece of an ideal partnership between a company and university. This study considers the comprehensive university-industry partnership through the lens of HEI corporate relations officers.

Academic corporate relations officers coordinate industry engagement at universities. They face multiple challenges when sustaining, growing, and cultivating industry partnerships. Company mission, goals, priorities, and current performance influence their ability and interest to collaborate with a university. Internally, multiple organizational factors on campus can advance or inhibit the success of a university-industry collaboration. This study analyzes the effect of select organizational factors on corporate partnership success. Organizational factors proposed to have an impact on the collaboration process include leadership, communication, conflict, trust, and commitment. Research supports evidence that both commitment and trust improve the level of communication (Sharma and Patterson, 1999), innovation (Yesil, 2014), and collaboration or cooperation (Plewa, 2009) in inter-organizational relationships. This research contributes to the existing literature by analyzing the impact of these organizational factors on the holistic partnership between industry and partner universities. The study expands upon existing work on determinants of successful collaborations within the nonprofit and education sector. This chapter supplements the study in Chapter 3 from the industry perspective. Analyses of perspectives from both sides of the university-industry relationships will inform the value and effectiveness of the partnerships.

## **Corporate Philanthropy & Engagement at Universities**

Philanthropy is a substantial part of American society. In 2018, American individuals, bequests, foundations, and corporations donated \$427.71 billion to over 1 million charities (Giving USA, 2019). The total giving in 2018 was the highest reported total in the 60-year history of the Giving USA report, surpassing the 2017 giving total by 0.7%. The largest source of giving is individuals (68%), followed by foundations (18%), bequests (9%) and corporations (5%). Of the nine main categories of organizations receiving charitable support, religion received the largest portion with \$124.52 billion (29.1%) and \$58.72 billion (13.7%) was invested into education (Giving USA, 2019).

Philanthropic support of colleges and universities has been invaluable to the growth and progress of institutions across the country. According to the Voluntary Support of Education, charitable support of HEIs reached an all-time high of \$46.73 billion in 2018, an increase of 7.2 percent over the 2017 total of \$43.60 billion. In 2018, seven HEIs reported receiving gifts over \$100 million. The largest source of giving to HEIs is foundations (30.0%), followed by alumni (26.0%), non-alumni individuals (18.3%), corporations (14.4%) and other organizations (11.3%) (CASE, 2019).

The percentage of corporate gifts to HEI's has remained consistent over the years. Many firms view their corporate giving as a form of investment, and in return, they require a measurable return from their philanthropic activity (Stendardi, 1992). Corporate philanthropy can provide clear economic gain for the company when the activity itself results in an economic increase. The profit maximization model of philanthropy is an approach to corporate philanthropy designed to directly or indirectly produce financial gain (Sanchez, 2000). A

corporate philanthropic activity linked to economic benefit for the company is investing in universities.

Although only 5% of total giving is from corporations (Giving USA, 2019), over 14% of private funding to higher education is from companies (CASE, 2019). This increased percentage of support for higher education shows how much industry values collaborating with academic institutions.

Corporations invest in universities, where they seek to recruit top talent as future employees and benefit from faculty research output. Few published articles explore corporate giving to universities. Several articles have focused on the research collaborations between industry and universities. According to Zumeta (2011), universities improve the local economy through partnerships with cities and states on research-based and community-based initiatives. Dr. Henry Etzkowitz is well known for his research developing the “triple helix” model. The term “triple helix” refers to the interactions of university-industry-government relations (Etzkowitz, 2003). Etzkowitz’s research shows that American universities serve as a collaboration site for the “triple helix” and has proven the model to be an effective method to leverage investments in research. Other authors have focused on the transfer of knowledge from academia to industry through research activity. The advancement of knowledge occurs through research-based acts of discovery and “through research that universities contribute to the shared stock of human knowledge” (Mintrom, 2008).

As public funding to higher education has decreased, universities have sought increased support from private sources. Industry support has a significant financial impact on higher education. According to Withers (2002), corporations traditionally support higher education for

three primary reasons: to increase their reputation and image, to support society and to support political interests that benefit corporations. Another primary goal is to recruit top talent to join the company's workforce. For example, the 3M Company established a program with its nine partner universities called the Frontline Initiative. The company has given over one million dollars in financial and in-kind support through this program, which aims to develop frontline or customer-facing talent from the undergraduate population (Ricks Jr. and Williams, 2005). The program exposes students to a strategic view of customer contact roles, and 3M is pleased with the results. Over 60% of the Frontline Initiative internship participants convert into full time hires, and the participants receive higher ratings than peers that did not participate in the program (Ricks Jr. and Williams, 2005). The Frontline Initiative allowed 3M to tie educational giving directly to the strategic business objective of recruiting top-quality frontline talent. There are similar cases at universities across the country.

### **Academic Corporate Relations Officers**

The majority of industry and university collaboration occurs through a corporate relations function, often found in a central office on campus or in the University Office of Development. While financial support is needed, desired, and most of the time preferred, companies engage in other ways with universities. Universities attempt to be responsive to the needs of industry. Industry is concerned with the pipeline of graduates that will work for them and in the future, lead their company. Companies build their brand on campus through many avenues, such as career center events, engaging with student societies, supporting programs, or through student scholarships. Some companies partner with universities on specific talent pipeline building

programs, resulting in a mutually beneficial arrangement for graduating students and the corporation (Figure 5).

<b>WIN-WIN EXAMPLES</b>	
<b><i>University gets</i></b>	<b><i>Corporation gets</i></b>
Jobs/internships for students; fellowships	Future employees/recruiting
Executive education participants	Executive education training for employees
Expanded research capacity; Access to real-world problems	Campus research collaborations
Licensing revenue	License to patents
Equipment/facility fees	Access to specialized equipment
Event funding	Event sponsorship/publicity

Figure 5: University - Industry Engagement for Mutual Benefit (NACRO, 2011)

Academic corporate relations officers coordinate industry engagement at universities. In simple terms, corporate relations officers are categorized into two types: campus-wide or unit-based (Walter and Watts, 2019). Campus-wide corporate relations officers, also known as central staff, represent the entire university. They are company-centric with their approach to identifying the appropriate engagements and investments at their university. The central corporate relations officers are driven by company goals, serve as a resource and advocate, connecting the industry partner across campus. Unit-based staff support a single college, department, or center at a university. Most often, unit-based officers report to or have a dotted line reporting structure to

the college dean, department chair, or center director. Unit-based primarily work with companies whose interest and focus is contained to the single unit (Walter and Watts, 2019).

If not through a corporate relations office, corporate relations officers may report through multiple channels at a university such as development, the office of research, career center, or based within a specific college. HEIs are complicated, bureaucratic, and hierarchical organizations. Corporate relations officers attempt to make their university accessible, easy to navigate, and responsive to external partners. The primary responsibilities of a corporate relations officer are to coordinate corporate partnerships, convene stakeholders (leadership, faculty, staff), synthesize information for corporate relationship planning and management and create strategic plans (Walter and Watts, 2019). The process of cultivating external partners, such as corporations, begins with an assessment of needs followed by internal coordination, planning, and aligning of a universities priorities and strengths (Clevenger and MacGregor, 2016). Outreach strategies to attract new partners include focusing on top employers on university alumni, top recruiters of new graduates, large and new employers in the region and expanding existing relationships expand into new initiatives (Walter and Watts, 2019).

Corporate relations office functions range in size, structure, and influence, with decentralized or centralized models (Clevenger, 2014; McCoy, 2011). In addition to the reporting structure and unit, academic corporate relations offices primarily use one of four standard business models: philanthropic, centralized, decentralized, or hybrid (McCoy, 2011).

The philanthropic model engages the company through gifts and success of the relationship from the university's perspective is based on the amount of charitable support. A centralized model is a holistic approach, resulting in the corporate relations office serving as a

concierge for corporate engagement across campus. In this model, corporate engagement may include gifts, research funding, recruiting activities, and coordinated student-facing activities. A centralized corporate relations model is primarily driven by the interests of the corporate partner and attempts to represent all university colleges, centers, and units. A central corporate relations contact increases efficiencies and conserves resources for both sides of the university-industry partnership (Castillo et al., 2015). The decentralized model consists of corporate relations officers working within a specific college or unit on campus, each working with the company. This approach provides additional support for companies to engage at deeper levels with select units, but lack of coordination between university colleagues can frustrate industry partners. In the hybrid model, offices are holistic but are housed outside of the traditional reporting structure of philanthropy and office of research. These hybrid offices serve as moderators and or mediators of any given relationship (McCoy, 2018). For example, a hybrid office may report to the system chancellor, university president, or economic development office.

A primary goal of corporate relations officers is to progress company connections along a relationship continuum. A widely accepted measurement tool details five phases of engagement that begin at traditional engagement and move towards holistic engagement (Figure 6). Each phase adds additional layers of industry participation with universities.

Initial engagement begins in the *Awareness Phase* when a company participates in recruiting events on campus. Large companies may participate in hundreds of career fairs a year. This level of engagement does not equate industry affection for the university. It is a transactional relationship with the singular focus of a company seeking new talent. Companies become *Involved* when they participate on Industry Advisory Councils, hire interns, and support

research grants with university faculty (Johnson, 2006). The *Support Phase* expands the company's presence on campus through student organizations, speaking on campus, and curriculum development. Curriculum input is provided through active engagement on an advisory council. Philanthropic support is also added at this stage. A true mutually beneficial university-industry partnership includes philanthropic support (Walter and Watts, 2019).

## The Partnership Continuum

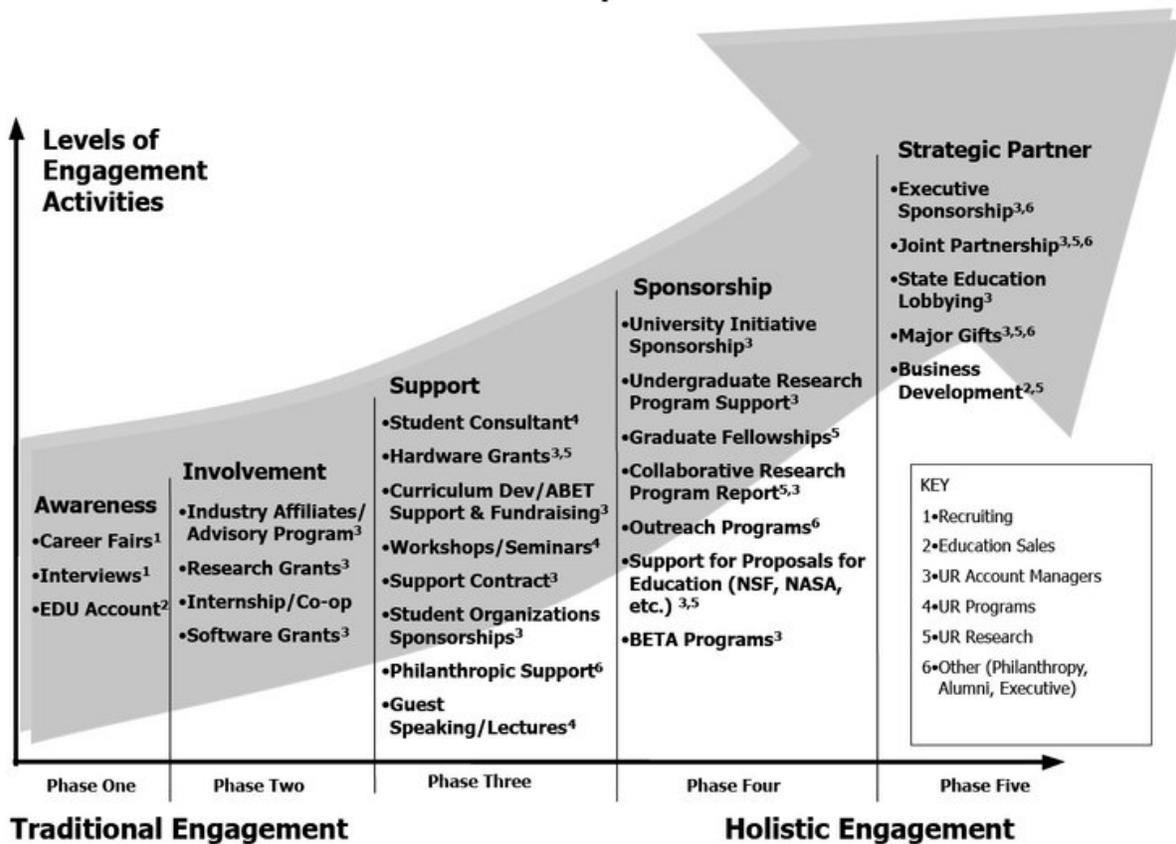


Figure 6: University-Industry Partnership Continuum (Johnson, 2006)

Moving to the *Sponsorship Phase* includes engagement beyond the initial company-centric goals. In this stage, companies support university-wide initiatives, undergraduate and

graduate research, and outreach programs. Corporations also partner on collaborative research and research proposals to federal funding agencies (Johnson, 2006). The transition to the final phase of *Strategic Partner* sees companies investing major philanthropic gifts at the university, engaging in lobbying efforts and partnering on research projects intertwined with business and product development. Corporate relations officers widely prescribe to the university-industry partnership continuum and develop engagement strategies to move companies from traditional to holistic engagement as a strategic partner.

Corporate relations officers work with industry partners across several areas. Companies invest on campus through multiple revenue streams, including philanthropy, recruiting, business development, marketing, learning & development, and research and development (Figure 7).



Figure 7: Accessing Multiple Revenue Streams from Corporate Partners (Walter and Watts, 2019)

Corporate relations officers face internal and external barriers when sustaining, growing, and cultivating industry partnerships. The framework of this study focuses on multiple organizational factors that impact the collaboration process. These factors on campus can advance or inhibit the success of the university-industry collaboration, and at times, are within the control of HEI leadership.

### Conceptual Framework

This study tests a conceptual model developed to test the effect of organizational factors on the success of the university-industry collaboration. Rast, Tourani, & Aslan (2015) conducted a literature review on process models proposed to measure collaboration, and on the factors included in the proposed models. The authors propose the following five organizational factors affect the industry-university collaboration process: leadership, communication, conflict, trust, and commitment (Figure 8). These organizational factors have been studied in literature.



Figure 8: Conceptual model for effect of organizational factor on university-industry collaboration  
(Rast, Tourani, & Aslan, 2015)

## *Leadership*

Leadership involvement leads to successful collaborations and partnerships. Existing literature indicates that the degree of participation partners (Gee, 1993; Burnham, 1997) and the involvement of senior leaders and executives (Bonaccorsi & Piccaluga, 1994; Davenport, Davenport, Grimes, & Davies, 1999; Gee, 1993) has a substantial effect on cooperative relationship effectiveness.

Effective, innovative, and cooperative leadership is vital to the collaboration process. A collaborative leader promotes group cohesion, team effectiveness, and motivation (Provan & Sebastian, 1998). A collaborative inter-organizational relationship can form and flourish in a structure of innovative leadership (Goldring & Sims, 2005). The leader serves as a champion of the partnership, advocating internally and externally for the strengthening of the alliance between organizations. This champion's dynamic capabilities and social relationships with senior leaders in industry are crucial to a successful collaboration (Dooley & Kirk, 2007).

Leadership within a partnership is different from that in a traditional, hierarchical organization. Leaders developing partnerships often lack formal control over the parties involved. Collaborative leadership can tackle the complexity of partnership buildings and find mutual benefit between potential partners. A qualitative study of 115 participants in community health partnerships identified five themes of collaborative leadership in alliance building: vision-based leadership, systems thinking, power-sharing, collateral leadership, and process-based leadership (Alexander, Comfort, Weiner & Bogue, 2001). In regards to partnerships, the most successful leaders recognize the demand for a proper balance of shared power, shared learning,

processes compared to results, interpersonal relationships and formal procedures, and between change and continuity (Alexander et al., 2001; Goldring & Sims, 2005).

Specifically, for university-industry collaboration, academic leadership greatly influences success. Academic leadership includes university system chancellors, presidents, deans, and vice-presidents. Ideally, academic leadership is enthusiastic about engaging corporations and participates in the partnership. At the highest levels, university leadership should empower the corporate relations office. This endorsement makes it more likely that research institutes, academic units, and faculty members will collaborate with the office (NACRO, 2011). Additionally, central leadership support encourages staff and faculty across campus to collaborate with the corporate relations staff and invest their time to develop corporate relationships. Well-organized, passionate, dedicated leadership facilitates the success of university-industry activities.

### ***Communication***

Communication is the exchange of information, policies, processes, beliefs, and ideas between two parties. Organizations often use specialized vernacular internally. Communication between organizations can require translation to ensure positive interactions and progression of a relationship. Open and regular communication is documented as one of the factors most recognized in successful organizational partnerships (Haire & Dodson-Pennington, 2002; Mattessich & Monsey, 1992; Davenport et al., 1999). Open and frequent communication systems allow for the development of both formal and informal communication channels, which keep members involved, informed and invested in the alliance (Haire & Dodson-Pennington, 2002; Mattessich, Murray-Close & Monsey, 2001; Mattessich & Monsey, 1992). Capable partners

foster mutual trust through communication and shared information related to goals (Kanter, 1994).

Concerning the complexity of the modern academic institution, open and frequent communication is required for collaboration across campus. A corporate relations office or staff member effectively coordinates industry engagement across departments and schools. The design of the collaboration must establish multiple levels of communication that self-manage within appropriate normative controls (Dooley & Kirk, 2007). This liaison is expected to be informed, responsive, and proactive in communication with corporate partners. On campus, the corporate relations officer forms strategic cross-campus teams to pursue engagement with companies. These teams manage an internal database of corporate data, and relevant engagement on campus, negotiate agreements, manage post-agreement activities, negotiate IP licensing, grow the relationship (NACRO, 2011). Communication is also appreciated on the company side. Industry professionals managing HEIs partnerships appreciate open, honest relationships, as well as a wealth of information regarding university offerings (Garber & Watts, 2019).

### ***Conflict***

High levels of conflict are damaging to partnerships. Three common sources of conflict are vague roles and expectations, a power imbalance within the alliance, and a lack of progress in achieving mutual goals. Effective partners foster mutual trust through open dialogue related to goals. This exchange includes sharing information and technical data to resolve conflicts or to navigate changing situations (Kanter, 1994). Conflict is unavoidable in inter-organizational relationships over a long period, with good partnerships encountering conflict and challenges at some point. Conflict is an element that cannot be eliminated, but instead should be controlled

(Van De Ven & Walker, 1984; Oliver, 1990). Managing conflict in a productive manner can promote synergy when contradicting perspectives generate new ideas and approaches to challenges. Partners can attempt to manage levels of conflict through varying types of conflict resolution (Artz & Brush, 2000).

Increased levels of interdependence are likely to increase the potential for conflict by increasing the need for coordination (Kumar and Van Dissel, 1996). Different types of interdependence lead to different sorts of risk and degrees of risk. With interdependence, the concept of working downstream and upstream are removed as the working relationship feed works back and forth between partners. In turn, problems or issues in one unit can affect the entire collaboration and cause increased conflict. (Kumar and Van Dissel, 1996).

Concerning university-industry collaboration, conflict can occur over IP policies, research priorities, technology transfer, curriculum, faculty, and students. When industry sponsors a research project or provides an unrestricted research gift, it is necessary to detail an IP arrangement to avoid conflict between parties. Faculty often advise student projects but do not contribute IP to the project, helping alleviate potential conflicts. A lack of clear roles and expectations on both the university and industry side can lead to conflict. Lack of structure contributes to the risk of conflict as misinterpretations and misunderstandings increase the likelihood of disagreements (Kumar and Van Dissel, 1996). Universities are often a melting pot of leaders and faculty from around the world, representing multiple languages and cultural norms. Differences in culture, customs, and business practices may also increase the potential for conflict. Cultural distance occurs when cultures are more different than alike, and has been shown to increase the probability of miscommunication (Triandis, 2000). The exchange of

information between industry and universities can be a source of conflict. The creation of inter-organizational data exchange systems can create power shifts within a supply chain. These power shifts can create winners and losers and in turn, can lead to conflict (Stern and Craig, 1971).

### ***Trust***

Trust is essential to the collaboration process. A widely accepted definition of trust in a seminal publication is “the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or confront that other party” (Mayer, Davis & Schoorman, 1995). In short, trust is the willingness to take risk and be vulnerable in a relationship. This definition means that at the lowest level of trust, one would take no risks at all. The authors assert that the complete lack of trust and distrust are the same thing (Mayer et al., 1995; Schoorman, Mayer & Davis, 2007). In a partnership, trust is more than behavior; it is a significant element that provides psychological comfort to both sides (Tyler, Patton, Mongiello, Meyer, Plewa, & Quester, 2007). Trust becomes an influential factor that can both facilitate and lessen barriers to collaboration.

Successful partnerships are believed to involve high levels of trust, reciprocity, and respect between partners (Davenport et al., 1999, Miller & Ahmad 2000). Literature commonly aims to identify the extent to which partners have confidence in each other. The mutual investment of partners helps sustain a cooperative partnership. The mutual commitment of leaders, coupled with core decision-making principles, can create a partnership culture without a focus on the distribution of perceived or real power (Goldring & Sims, 2005). Partners that have

developed trust become well aware of the possible pitfalls of one partner overpowering the other and this self-awareness helps diffuse power across the partners (Goldring & Sims, 2005).

Regarding university-industry collaboration, trust builds over time and with intentional and consistent engagement. University-industry relationships are distinguished by the exchange of confidential information, which includes a presence of risk. The willingness to collaborate freely despite the risk presumes a high level of mutual trust (Rosendo-Rios, Ghauri & Zhang, 2016).

Successful university-industry partnerships establish mutual need, benefit, and continuity in the relationship achieve shared goals. To achieve shared goals, universities ought to be provided insight into the company's vision and future to enhance the partnership. This exchange of information requires trust. To enhance trust, both the university and corporate partner ought to fulfill their commitments and obligations made to each other. Examples on the academic side include institutional commitment to a program a company supports, investment in career preparedness that benefits employers, and faculty exceeding expectations of an industry-sponsored research project. On the industry side, paying financial pledges, providing promised data or equipment for research, and recruiting interns from the university are a few examples of obligations to fulfill. Establishing trust is important for the success of current collaborations, but is even more critical to guarantee the possibility of future partnerships (Rast et al., 2015).

### ***Commitment***

Existing literature supports the importance of commitment to partnership success. Key indicators used in past research as measures of commitment include the enthusiasm of both parties for the partnership, which is reflected in the beliefs and behaviors of the partners

(Dowling, Powell & Glendinning, 2004). Successful partnerships are believed to depend on the level of commitment and engagement of the involved parties (Evans & Killoran 2000; Hudson 2002; Sullivan, Barnes, & Matka, 2002). Further, conceptualized partnership models consistently include commitment as a key contributing factor of success (Dowling et al., 2004; Rosendo-Rios et al., 2016). In addition to establishing mutual commitment, building a shared culture serves as a central tenet to the cooperative posture of the partnership (Goldring & Sims, 2005).

The commitment of the partners has a substantial effect on university-industry collaboration (Plewa & Quester, 2006; Rosendo-Rios et al., 2016). In situations with high levels of commitment, both parties can attain both individual and joint objectives and better understand the strategic choices made (Rast et al., 2015). Literature has conceptualized university-industry relationships as being ‘trusting, committed, and interactive relationships between university and industry entities, enabling the diffusion of creativity, ideas, skills, and people to create mutual value over time’ (Tyler et. al, 2007).

Commitment between university-industry partners is developed over time and through consistent and intentional engagement. University corporate relations staff bridge the academic and corporate worlds, developing collaborations that support the mission of each partner (Walter and Watts, 2019). Building university-industry commitment involves identifying and matching company strategic needs and the university’s strengths. Through listening to all stakeholders, shared goals are developed, projects and initiatives are designed to create mutually beneficial outcomes, and there is a commitment to ensuring collaboration goals are met (NACRO, 2011). Companies show their commitment through displayed desire and eagerness maintain and strengthen a valued partnership.

Partnerships inevitably rely on relationships and trust between individuals, attention to detail, and communication skills make a real difference in successful relationships. The organizational factors: leadership, communication, conflict, trust, and commitment, will be tested in this study with the following hypotheses:

*H<sub>1</sub> Executive engagement has a positive effect on the success of industry partnerships.*

*H<sub>2</sub> Open communication channels have a positive effect on the success of industry partnerships.*

*H<sub>3</sub> As conflict decreases, it has a positive effect on the success of industry partnerships.*

*H<sub>4</sub> As trust increases, it has a positive effect on the success of industry partnerships.*

*H<sub>5</sub> As the level of commitment increases, it has a positive effect on the success of industry partnerships.*

## **Data & Methodology**

Data collected via a 2019 NACRO survey informs this study. NACRO<sup>2</sup> is a global organization of individuals working in or interested in academic corporate relations (NACRO, 2019). NACRO has 700 active members, and a database of over 2,000 lapsed or potential members. Members primarily work at HEI's across the US, with 20 members at 15 institutions in other countries. Annually, NACRO conducts a member survey to assess member satisfaction with the organization, collect data on corporate relations office structure, leadership engagement,

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<sup>2</sup> Additional information on NACRO found on page 80

and other benchmarking data for the field. NACRO has conducted an annual member survey for ten years. Since 2017, survey results have exceeded 250 responses.

The target population included 700 active NACRO members, who are primarily corporate relations officers who manage industry partnerships at universities. NACRO received 293 survey responses between March 5, 2019, and May 10, 2019. Of the 293 responses, nine responses were from industry members<sup>3</sup> and removed from the sample. Additionally, anonymous respondents that chose not to share their institution name completed 60 surveys. These responses were removed from the sample since the institution name was required to insert dependent variable corporate giving data. With 224 identifiable responses, 180 individuals answered the optional questions related to the independent variables of collaboration factors. The initial survey response rate was 41.9 percent with 293 responses, and the final response rate is 25.7 percent, with 180 responses that included institution name and answers pertaining to the independent variables. The 180 survey respondents work at 125 different universities (see Appendix for the list of institutions).

The list of the top twenty universities based on the amount of corporate support includes some of the top-ranked HEI's in the world. In 2018, Ohio State University received the most corporate funding with a total of \$185.3 million, followed by Stanford University (\$169.1

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<sup>3</sup> In 2017, NACRO implemented a new strategic plan that opened up membership to anyone working on university-industry partnerships including s from fields including academia, nonprofit organizations, industry, and government (NACRO, 2019).

million) and University of Colorado (\$141.9 million). Seven universities received over \$100 million in corporate support in 2018; eight received \$50-\$100 million, and five universities received \$35- \$50 million (Table 15). The top twenty universities based on corporate funding are members of the prestigious AAU, with the exception of the University of Notre Dame.

Table 15: Universities Receiving the Most Corporate Philanthropic Support, 2018  
(CASE, 2019)

Organization	2018 Total Support	2018 Corporate Support	2018 Corporate Giving Percent	2018 3 Largest Corporate Gifts
Ohio State University	\$ 436,973,769	\$ 185,312,062	42%	\$ 76,235,843
Stanford University	\$ 1,097,060,553	\$ 169,140,183	15%	\$ 54,336,389
University of Colorado	\$ 328,346,971	\$ 141,979,206	43%	\$ 26,969,308
Northwestern University	\$ 397,112,898	\$ 120,381,573	30%	\$ 102,889,677
University of Texas at Austin	\$ 357,949,721	\$ 110,095,323	31%	\$ 5,968,223
Indiana University	\$ 408,461,793	\$ 109,850,882	27%	\$ 41,409,939
University of Southern California	\$ 649,970,748	\$ 108,487,421	17%	\$ 11,058,983
University of Pennsylvania	\$ 717,529,290	\$ 93,785,139	13%	\$ 12,682,013
University of Washington	\$ 711,063,379	\$ 88,569,888	12%	\$ 29,798,902
University of Florida	\$ 339,867,452	\$ 84,176,531	25%	\$ 11,010,483
University of Arizona	\$ 277,938,236	\$ 82,357,996	30%	\$ 32,753,246
Massachusetts Institute of Technology	\$ 469,932,565	\$ 69,905,989	15%	\$ 9,353,591
Texas A&M University	\$ 305,656,502	\$ 67,804,262	22%	\$ 11,236,846
University of North Carolina at Chapel Hill	\$ 374,533,679	\$ 63,203,129	17%	\$ 20,509,427
University of Illinois at Urbana-Champaign	\$ 233,315,831	\$ 57,905,134	25%	\$ 17,993,422
University of Wisconsin-Madison	\$ 274,966,238	\$ 45,416,628	17%	\$ 13,357,823
University of Notre Dame	\$ 502,771,320	\$ 43,045,726	9%	\$ 10,820,563
Purdue University	\$ 192,302,566	\$ 39,112,593	20%	\$ 8,172,656
University of Michigan	\$ 490,035,112	\$ 37,780,479	8%	\$ 7,497,260
Rutgers University	\$ 158,936,266	\$ 37,210,801	23%	\$ 7,309,939

Additional descriptive statistics provide information on the giving totals of universities represented in the sample. Total philanthropic support ranges from \$1.19 million to \$10.97

million, with a mean of \$179.52 million and a standard deviation of \$1.86 million. The endowment total for universities in the sample ranges from \$1.31 million to \$26.46 million, with a mean of \$25.84 million and a standard deviation of \$39.13 million (Table 16).

Table 16: Summary Statistics, Philanthropic Giving (2018)

Variable	Obs	Mean	Std. Dev.	Min	Max
Total Philanthropic Support (x\$100,000)	180	\$1,795.22	\$1,860.70	\$11.91	\$10,970.61
Endowment Total (x\$100,000)	180	\$25,842.33	\$39,127.90	\$13.11	\$26,4649.30

Survey respondents assessed the presence of the following organizational factors of the partner collaboration process on their campus: leadership, communication, conflict, trust, and commitment. The analysis evaluates the impact of these collaboration factors on the success of industry partnerships.

### *The Model*

$$\text{Industry Partnership Success} = \beta_0 + \beta_1(\text{Engagement}) + \beta_2(\text{Communication}) + \beta_3(\text{Low Conflict}) + \beta_4(\text{Trust}) + \beta_5(\text{Commitment}) + \beta_6(\text{controls})$$

The five observed independent variables are factors of the collaboration process: (1) leadership, (2) communication, (3) conflict, (4) trust, and (5) commitment. Survey respondents provided insight on a scale of 1 to 5, 1 = no presence of this factor, and 5 = the highest level of this factor. Summary statistics on the independent variables show the means for the presence of

collaboration factors range from 2.609 to 3.710. The collaboration factor with the highest presence is commitment, with a mean of 3.710 and a standard deviation of 0.974. After commitment, the next highest collaboration factor present is trust (3.478), followed by leadership (3.356) and then communication (3.203) (Table 17). The collaboration factor of conflict has a negative impact on partnerships, meaning a lower mean of 2.609 is good.

Table 17: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Leadership	180	3.356	1.112	1	5
Commitment	176	3.710	0.974	1	5
Communication	177	3.203	1.008	1	5
Trust	178	3.478	0.934	1	5
Conflict	179	2.609	0.973	1	5
Corporate Giving Percent	180	0.173 (17.3%)	0.101 (10.1%)	0.015 (1.5%)	0.497 (49.7%)
Corporate Funding (x\$100,000)	180	\$318.97	\$389.35	\$0.57	\$1,853.12
RI Research Institution (Y = 1)	180	0.66	0.47	0	1
Public University (Y = 1)	180	0.70	0.46	0	1
Holistic Corporate Relations Office (Y = 1)	180	0.51	0.50	0	1
Enrollment	176	32,608.11	22,933.84	1,095	103,567

Two dependent variables representing industry partnership success are tested: corporate giving percentage of a university giving total and total corporate funding. VSE provides the giving data. Descriptive statistics show corporate giving percentage ranges from 1.5 percent to 49.7 percent, with a mean of 17.3 percent and a standard deviation of 10.15 percent. Corporate

funding to HEIs ranges from \$57,000 to \$185.31 million, with a mean of \$31.89 and a standard deviation of \$38.94 million (Table 17). A variance inflation factor (VIF) test is run to test for multicollinearity. The VIF scores are low ranging from 1.09 to 1.94, with a mean VIF of 1.45 and suggest very low levels of correlation.

Control variables include (1) enrollment; (2) public/private university; (3) university research classification; and (4) presence of a corporate relations office. The majority of the sample work at public universities (70.0%) classified as RI Institutions (66.1%) in 2018, with enrollment exceeding 10,000 students (83.9%). The sample is almost evenly split between individuals working in a holistic corporate relations office (51.1%) versus other roles on campus (48.9%) (Table 17).

## **Findings**

This study captures the academic perspective on university-industry partnerships as it relates to collaboration factors impact corporate partnerships. Regression analyses are conducted on each independent variable separately and in one combined model. The study does not find any significant relationships between the collaboration factors and corporate giving percentage.

As seen in Model 1, increases in leadership have a slightly negative impact on the corporate giving percentage (Table 18). For every increase in the presence of leadership, the corporate giving percentage decreases by 0.79 percentage points. The analysis of commitment also has negative results. For every increase in the presence of commitment, the corporate giving percentage decreases by 0.78 percentage points. Communication also has a negative impact, decreasing corporate giving percent by 0.43 percentage points (Model 3).

Table 18: Regression Analysis, Corporate Success Measured through Corporate Giving Percent

CORPORATE GIVING PERCENT	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5
Leadership	-0.789 (0.625)				
Commitment		-0.779 (0.768)			
Communication			-0.431 (0.634)		
Trust				-1.780** (0.867)	
Conflict					0.227 (0.782)
Holistic CR Office (Y = 1)	-0.317 (1.490)	-0.175 (1.497)	-0.442 (1.505)	-0.616 (1.449)	-0.521 (1.500)
Research Inst (Y = 1)	-2.522 (1.628)	-2.296 (1.710)	-2.382 (1.640)	-2.341 (1.694)	-2.499 (1.658)
Public Univ (Y = 1)	5.483*** (1.742)	5.134*** (1.827)	5.367*** (1.788)	4.274** (1.909)	5.198*** (1.888)
Enrollment	0.000146*** (4.67e-05)	0.000146*** (4.77e-05)	0.000137*** (4.75e-05)	0.000163*** (4.76e-05)	0.000143*** (4.69e-05)
Constant	13.32*** (2.228)	13.62*** (2.809)	12.45*** (2.380)	17.14*** (3.363)	10.42*** (2.320)
Observations	176	172	173	174	175
R-squared	0.220	0.219	0.206	0.240	0.213

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

In Model 4, we find our only significant result. Increases in the presence of trust has a negative effect, decreasing corporate giving percent by 1.78 percentage points ( $p < 0.05$ ). The higher presence of conflict has a positive impact on the dependent variable, increasing corporate giving percent by 0.22 percentage points. Two control variables, organization type, and enrollment have significant effects on increasing corporate giving percent. Organization type has

a significant ( $p < 0.01$ ) positive impact on corporate giving percent in each model, showing the powerful effect of being a public institution. Being a public university increases corporate giving percent by 4.27 to 5.48 percent. Enrollment has a small but significant positive impact in each model ( $p < 0.05$ ); large universities have a higher corporate giving percentage (Table 18).

Table 19: Regression Analysis, Corporate Success Measured through Corporate Giving Percent

CORPORATE GIVING PERCENT	(6) Model 6
Leadership	-0.621 (0.832)
Commitment	0.257 (1.040)
Communication	0.530 (0.781)
Trust	-2.047* (1.102)
Conflict	0.144 (0.795)
Holistic CR Office (Y = 1)	-0.633 (1.553)
RI Research Institution (Y = 1)	-2.307 (1.790)
Public University (Y = 1)	4.509** (2.047)
Enrollment	0.000155*** (4.77e-05)
Constant	17.34*** (4.276)
Observations	168
R-squared	0.241

Robust standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

When all variables are run in the same model, the study finds a similar singular significant relationship (Table 19). Slightly negative effects are found with leadership (0.62 percent) and conflict (0.08 percent). A slightly positive effect is found with increases in commitment (0.25 percent) and communication (1.2 percent). Trust remains the single significant finding ( $p < 0.1$ ), although contrary to Hypothesis 4, the effect is negative ( $\beta = 2.04$ ). Both public organization type and enrollment continue to have a significant ( $p < 0.01$ ) positive impact on corporate giving percent. Being a public institution increases corporate giving percent by 4.51 percent (Table 19).

Additional analysis is conducted on corporate funding in dollars, an alternate measurement of success of corporate partnerships (Table 20). A greater presence of leadership continues to have a negative impact ( $\beta = 35.28$ ). Similarly, trust ( $\beta = 43.04$ ) and conflict ( $\beta = 29.71$ ) have a negative relationship with corporate funding totals. The only positive finding is an increase in corporate funding associated with increases in communication, increasing corporate funding by \$1.34 million. The only significant finding is an increase in Commitment has a negative impact on corporate funding; decreasing corporate support by \$4.20 million ( $p < 0.1$ )

Three control variables have significant effects on increasing corporate giving percent. Being a RI Research Institution significantly affects funding, with effects in Model 7 through Model 11 ranging from \$13.3 to \$14.5 million ( $p < 0.05$  and higher). Enrollment has a significant impact on corporate funding ( $p < 0.01$ ), resulting in an increase of about \$1,000 per additional student enrolled. A surprising finding is that being a public university decreases corporate funding by a range of \$17.58 million to \$210.30 million ( $p < 0.01$ ) (Table 20).

Table 20: Regression Analysis, Corporate Success Measured through Corporate Funding

CORPORATE FUNDING (DOLLARS)	(7) Model 7	(8) Model 8	(9) Model 9	(10) Model 10	(11) Model 11
Leadership	-35.28 (22.75)				
Commitment		-42.00* (21.91)			
Communication			13.36 (24.33)		
Trust				-43.04 (32.66)	
Conflict					29.71 (30.34)
Holistic CR (Y = 1)	-41.85 (51.59)	-34.38 (52.26)	-53.44 (51.89)	-44.84 (51.83)	-48.76 (52.12)
Research Inst (Y = 1)	139.4** (53.71)	145.4*** (54.87)	133.5** (54.07)	144.7*** (55.47)	135.6** (54.50)
Public Univ (Y = 1)	-175.8*** (56.84)	-192.2*** (57.05)	-178.5*** (56.44)	-210.3*** (56.58)	-194.5*** (60.38)
Enrollment	0.0103*** (0.00205)	0.0103*** (0.00210)	0.0101*** (0.00216)	0.0105*** (0.00213)	0.0101*** (0.00208)
Constant	159.9** (78.22)	204.0** (88.21)	17.63 (72.80)	208.1* (117.1)	-11.41 (70.28)
Observations	176	172	173	174	175
R-squared	0.371	0.369	0.359	0.368	0.364

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

When all variables are run together in Model 12, four of the five collaboration factor variables continue to have a negative effect on corporate funding (Table 21). In an exciting and slightly redeeming finding for the author, a significant positive effect exists between communication and corporate funding (p<0.05). Increases in the presence of communication result in a \$5.58 million increase in corporate support. This finding confirms Hypothesis 2.

Table 21: Regression Analysis, Corporate Success Measured through Corporate Funding

CORPORATE FUNDING (DOLLARS)	(12) Model 12
Leadership	-38.97 (30.05)
Commitment	-27.60 (35.85)
Communication	55.88** (28.29)
Trust	-38.57 (44.97)
Conflict	18.26 (31.72)
Holistic CR Office (Y = 1)	-46.59 (56.23)
RI Research Institution (Y = 1)	145.9** (57.95)
Public University (Y = 1)	-199.6*** (64.39)
Enrollment	0.0103*** (0.00219)
Constant	203.5 (147.1)
Observations	168
R-squared	0.390

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Control variables have similar effects in Model 12. Increases in enrollment ( $\beta = 0.010$ ) and being a research institution ( $\beta = 145.9$ ) have significant positive effects on corporate funding ( $p < 0.01$ ). Similarly to Model 7 through Model 11, being a public university has a negative relationship with corporate support through dollars ( $\beta = 199.6$ )

In all the models, working in a holistic corporate relations shop (reported by respondents) has a negative effect on corporate success measure through both percentage and total dollars.

Although not significant, this finding is surprising and contradictory to both the widespread trend in academic corporate relations and the teachings of NACRO.

## **Discussion**

The collaboration factors analyzed in this study were expected to significantly impact the success of corporate partnerships, measured by the percentage of funding from corporations and total dollars from companies. The collaboration factors studied were: leadership, commitment, communication, trust, and low levels of conflict. However, the present study only finds one significant positive relationship between the collaboration factor of communication and total corporate funding (Model 12). The study does not find significant positive relationships between the collaboration factors and corporate giving percentage. Considering the results of the study, the author reflects on the collaboration factors in relation to three environments: corporate giving measurements, the fundraising mindset, and the academic setting.

First, as discussed throughout this dissertation, university-industry partnerships include multiple engagements in addition to funding. While funding is a quantified measure, it may not accurately depict the success of corporate partnerships in regards to the selected collaboration factors. Large universities that experience astronomical fundraising totals may have lower levels of collaboration factors. Consider the top two recipients of corporate funding in 2018: Ohio State University (\$185.3 million) and Stanford University (\$169.1 million). With massive fundraising results, come high expectations that may be impossible to meet. That type of environment becomes business-like and transactional in two ways. First, a tremendous corporate gift of, for example, \$5 million, is diminutive at a university like Ohio State University or Stanford University, while the same gift would be historical at the majority of academic institutions.

Second, with a history of the highest levels of corporate partners and financial support, the university may not need to build partnerships in the same manner. Instead of engaging leadership, fostering open communication, building commitment, developing trust, and actively thwarting conflict, Stanford may use the approach of, “We are Stanford.” My intention is not to ridicule Stanford, but it serves as an example of how the real impact of collaboration factors may be lost in the numbers. The highest ranked universities, with world-renowned faculty and billion dollar endowments may not need to work as hard at building partnerships when corporations are constantly knocking at the door to collaborate with them.

Additionally, survey respondents in the sample that manage comprehensive university-industry partnerships may view fundraising as a small part of their role, or may not consider it at all. This lack of consideration further complicates the ability to compare collaboration factors to a corporate partner success measurement that may be unsupported by survey respondents.

Second, the mentality of fundraisers may influence the presence of collaboration factors. Fundraisers, including Corporate Relations Officers, are mostly external facing staff that function autonomously within their departments. They manage a portfolio of donors; have annual goals to achieve in dollars raised, and goals for contact with their portfolio. Beyond the occasional staff meeting, fundraisers spend the majority of their time out of the office. Fundraising is an interesting occupation; goals can be met a month into the year with a mega gift, met the last month of the year by \$1 or not met at all. The “lone ranger” approach to fundraising results in increased self-efficacy in fundraisers. A 2013 study showed little evidence that Chief Fundraiser leadership style had a significant impact on the self-efficacy of their fundraisers

(Edgington, 2013). If fundraisers naturally have the self-efficacy and confidence to perform their jobs, perhaps they also feel the selected collaboration factors are not crucial to their success.

Last, the higher education environment is hierarchical and vast. Clear rules of engagement exist within an academic setting. HEI's exist to conduct ground-breaking research, innovate, further academic learning, and produce top talent in students. The academic order of importance is more or less: Academic leadership including the President's Cabinet, Vice-Presidents, Deans, Center Directors, Department Heads, followed by Faculty. Vice-Presidents of Development might be respected at the same level as other Cabinet members, but the Corporate Relations Officer is most certainly towards the bottom of the totem pole. This pecking order may result in the individuals working directly with corporate partners not feeling the existence of the collaboration factors studied in this research.

Regarding enrollment, HEIs in this sample range from 1,000 to 100,000 students. Do students feel more connected to their university when they are one of 1,000 or one of 100,000? The author assumes that the majority of students would feel more connected when they are one of 1,000. Likewise, imagine how individual donors and corporations feel as they connect to large universities. The corporate relations officer at a large university certainly works in quantity versus quality of partnerships. Consider the corporate relations officer engaging partners at the smaller university. They may build more trust with their prospects; develop commitment between organizations before asking for funding, and engage leadership actively if the potential partner is one of few in the pipeline. The academic setting impacts the presence of collaboration factors and may not align as expected with corporate funding totals.

Overall, additional research is needed on the selected collaboration factors and corporate partner success.

## **Conclusion**

Understanding the impact of collaboration factors on the success of industry partnerships informs the ideal environment for such alliances to thrive. Leadership, commitment, communication, trust, and low levels of conflict were expected to have significant positive effects on the success of corporate partnerships. This study failed to find significant positive relationships between the collaboration factors and corporate partner success, in 11 of the 12 models. One significant positive relationship between the collaboration factor of communication and total corporate funding (Model 12). The study fails to confirm existing literature declaring the selected collaboration factors significantly positively affect the success of corporate partnerships.

Limitations of the study include selected variable measurements, ambiguous temporal precedence, confounding variables, history, and maturation. There are multiple ways to measure the success of corporate partnerships. In order to quantify the relationships between collaboration factors and corporate partnerships, corporate giving percentage, and corporate funding were selected as dependent variables. The corporate giving percentage was chosen as a comparable dependent variable between universities of all sizes. The author acknowledges that these variables may not be the best measurement of corporate partnership success. Ambiguous temporal precedence is possible since some of the collaboration factors might be developed after building a corporate partnership, and before. It is difficult to predict, for example, that the highest levels of trust, commitment, and communication are a cause or effect of successful

corporate partnerships. Other internal validity threats are confounding, history, and maturation. Changes in corporate giving percentage and corporate funding could be attributed to another related variable, to several factors or event outside of the study or to natural maturation of giving totals.

Many factors included the five analyzed in this study, impact the formation and stewardship of partnerships. These collaboration factors are somewhat within the control of university leadership. Future research will expand the assessment of leadership, commitment, communication, trust, and low levels of conflict, as well as identify a more accurate way to measure the success of corporate partnerships. Increased understanding of the impact of these collaboration factors on university-industry partnerships can benefit both academics and practitioners.

## **CHAPTER 5**

### **CONCLUSION**

This study examines university-industry interaction in the changing economic landscape. Among the multitude of resources upon which HEIs depend, the need for financial resources is insatiable. Universities are seeking increased funding from alternative sources. The exchange-based power created by university dependence on funding should be considered by academic leadership to prevent complete reliance on an external source.

Chapter 2 examined revenue diversification of Texas public universities in response to change in state funding through four analyses. First, declines in the percentage of HEIs budget from state funding was confirmed to significantly increase revenue diversification. Second, the

reduction in state funding was also associated with significant increases in revenue from private gifts. While this finding is positive for potential revenue for HEIs, universities should not shift from one dominant resource provider (the state) to another (private gifts). Public universities especially do not want a power shift towards private funding that interferes with their mission. The third hypothesis that decreases in state funding produces an increase in revenue from government grants was supported but not confirmed. Last, the hypothesis of universities increasing Development Office budgets as a response to decreased state funding was rejected. Although the current analysis of Development Office Budgets lacks significant findings, additional research is warranted. Public institutions can not adjust tuition prices at their leisure, but they can control other revenue streams or the effort to increase the revenue stream. Additional effort and resources can be invested in soliciting gift and grant revenue. Although the shifts in funding were incremental in the 11 years analyzed in Chapter 2, more drastic changes are expected over a more extended period.

In Chapter 3, a second study analyzes multiple determinants of HEI engagement and partnership satisfaction from an industry perspective. Several factors were confirmed to impact company satisfaction in industry-university partnerships. Having a dedicated university relations manager at the company, and a single point of contact at a university significantly improves partner satisfaction. These positions mirror each other on either side of the university-industry engagement, serving as a resource working towards a mutually beneficial partnership. They share similar goals of creating, building, and sustaining successful university-industry partnerships. This finding suggests that a university relations manager is a useful resource for companies and also a good use of company financial resources. The single point of contact at a

university contact facilitates the partnership, streamlines communications, and coordinates engagement with universities. This significant positive impact of a single contact reinforces a fundamental tenet of holistic university corporate relations. This finding suggests that universities will increase their industry partner satisfaction by supporting a holistic approach to corporate relations.

Next, both academic engagement goals and partner selection criteria have a significant positive impact on industry satisfaction. These results suggest the more intentional industry is with the why and how they engage with universities, the more satisfied they will be with their results. Increased intentionality also results in better use of company resources of time, talent, and treasure (funding).

In Chapter 4, the academic perspective on collaboration factors influencing the success of corporate partnership produced unanticipated results. The selected factors of leadership, commitment, communication, trust, and conflict did not produce the hypothesized significant positive impacts. This study contributes to the existing literature by testing collaboration factors indicated to influence the success of partnerships.

Existing research supports the importance of the selected factors on collaboration, and the combination of factors for improved cooperation in inter-organizational relationships. The limited literature has conceptualized university-industry partnerships as ‘trusting, committed, and interactive relationships between university and industry entities, enabling the diffusion of creativity, ideas, skills and people to create mutual value over time’ (Tyler et. al, 2007). Regarding university-industry collaboration, trust builds over time and with intentional and consistent engagement. University-industry relationships are distinguished by the exchange of

confidential information, which includes a presence of risk. Existing research, and common sense, support that high levels of conflict are damaging to partnerships. The commitment of the partners has a substantial effect on university-industry collaboration and the ability to attain both individual and joint objectives. However, these qualitative assertions were not quantifiably supported in this study.

Concerning the complexity of the modern academic institution, open and frequent communication is required for collaboration across campus. A corporate relations officer effectively coordinates industry engagement across departments and schools. However, a holistic corporate relations office had a negative effect on both corporate giving percent and corporate funding totals. Although not significant, this finding is surprising and contradictory to both the industry trends in academic corporate relations and the central tenets of NACRO. The result also contradicts a Chapter 3 finding that industry satisfaction is increased with a single point of contact at a university. This finding deserves additional attention.

### **Contributions & Future Research**

This research makes significant contributions to the field of literature in public and nonprofit management and organizational behavior. The resource exchange between universities and industry is not fully understood. Chapter 2 expands on previous revenue diversification research with a focus on higher education and gift and grant revenue sources. Additionally, the analysis of a possible university response of increasing Development Office budgets. Although the current analysis of Development Office Budgets lacks significant findings, additional research will be conducted to assess the role that development offices play in the changing higher education economic landscape.

Chapter 3 explores industry perspective on university partnerships. While there is growing literature on corporate philanthropy, there are few studies on corporate engagement at universities and the majority focus on research and technology transfer. This study contributes to the emerging academic study of university-industry partnerships and adds to the few studies conducted from the industry perspective.

Concerning funding to universities, the majority of research continues to focus on individual alumni engagement. Chapter 4 provides the most comprehensive analysis of multiple organizational factors impacting university-industry partnerships. The study tests collaboration factors essential to partnership success that have been documented in the existing literature. This study also provides a unique contribution by collecting insight from corporate relations officers, who manage industry partnerships at universities.

Overall, this research has practical contributions for both industry and HEIs. Assessing the perspectives of both sides of the university-industry partnership in one comprehensive study is distinctive. Understanding determinants and organizational factors that can positively impact university-industry partnerships benefit both sides of the alliance. The author anticipates results will encourage an increased understanding of university-industry engagement, as well as factors impacting partner satisfaction and success.

## APPENDIX

### SUPPLEMENTARY SURVEY INFORMATION

#### **Industry Survey Respondent Companies**

Anonymous, AAA, ADM, Adobe, Agilent, Alaska Airlines, Amazon, AMD, Amgen, Andersen Windows, ArcelorMittal, Ardent Mills, AT&T, ATB Financial, AXIS Capital, BASF, Bayer, BD, BECU, Bell, BenchSci, Blue Origin, Broward College, Campbell Soup, Canadian Natural, Capital One, Caterpillar, Chainalytics, Chevron, Cisco, Coke, Conformis, Corteva Agriscience, COUNTRY Financial Digitalab, Credit Suisse, Delta Air Lines, Diversified Maintenance, Eastman Chemical Company, Ecolab, Enterprise Holdings, Exaptive, Express Scripts, EY, Fabcon Precast, Facebook, Familia Dental, Fast Enterprises, Fidelity Investments, Ford Motor Company, Fox Chase Chemical Diversity Center, Futurewei Technologies, Gartner, General Dynamics Mission Systems, GSK, HM.CLAUSE Limagrain, HomeAdvisor, HP, Hyatt, IBM Corporation, Intel, IPG Photonics, J. F. Ahern Co, Lam Research, Land O'Lakes, Inc., LGS Innovations, LifeScan, Lincoln Electric, LyondellBasell, Magna International Inc., Medtronic, Mensor, Mercury Marine, Microsoft, MilliporeSigma, National Instruments, NEC Corporation of America, NFPA, Norfolk Southern, Northrop Grumman, Novozymes Inc., Oasis Petroleum, ONEOK, Optum, Oshkosh Corporation, PepsiCo, Phillips 66, Pratt & Whitney, Prent Corporation, Principal, RBC, Samsung Semiconductor Inc., Samsung Strategy & Innovation Center, Shell Oil Company, SICK, Siemens, Spanner Product Development, State Farm, Suncor, Taconic Biosciences, Texas Instruments, The Dow Chemical Company, The Walt Disney Company, The Whiting-Turner Contracting Company, The Zebra, Thermo Fisher Scientific, Tower Optical Corporation, Volvo Group Truck Technology, Xcel Energy, Yahoo Research, Zillow, Zymergen Inc.

#### **Industry Survey Interviews, Name and Company**

Anonymous, Anthony Agusti (Caterpillar Inc.), Gretchen Baier (Dow Chemical Corp.), Nathan Bales (General Dynamics Mission Systems), Ethan Berg (LyondellBasell), Lauren Faulkner (General Dynamics Mission Systems), Donna Gulezian (Taconic Biosciences), Ronda Hamm (Corteva Agriscience), Jacob Harrison (Samsung Strategy and Innovation Center), David Hays (Axis Capital), Christopher Hewitt (BASF), William Hunter (Chevron), Edward Krause (Ford Motor Company), Jill Macchiaverna (Exaptive, Inc.), Samuel McLaughlin (Volvo Group Truck Technology), Jack Wenstrand (Agilent), Lindsay Wilson (State Farm Insurance).

**Table A1: NACRO Member Survey, Respondent Institutions**

University Name	
American University	Stevens Institute of Technology
Arizona State University	SUNY at Albany
Auburn University-Main Campus	Syracuse University
Baylor University	Texas A&M University
Boise State University	Texas State University-San Marcos
Boston College	University of Tennessee
Boston University	University of Texas at Arlington
Broward College	University of Texas at Austin
California State -Dominguez Hills	University of Texas at Dallas
Carleton College	Tufts University
Carnegie Mellon University	Tulane University of Louisiana
Central Washington University	University of Arizona
Chapman University	University of Arkansas
Clemson University	University of California-Santa Cruz
Colorado School of Mines	University of California-Davis
Cornell University	University of California-San Diego
Dartmouth College	University of Chicago
DePaul University	University of Colorado
Fairleigh Dickinson University	University of Delaware
Fitchburg State University	University of Denver
Florida State University	University of Florida
Gannon University	University of Hartford
George Washington University	University of Houston
Georgia Institute of Technology	University of Idaho
Georgia State University	University of Illinois at Chicago
Hamilton College	University of Illinois at Urbana-
Illinois State University	University of Kansas
Indiana University	University of Kentucky
Iowa State University	University of Louisiana at Lafayette
James Madison University	University of Massachusetts Worcester
Kansas State University	University of Memphis
Kent State University	University of Miami
Lafayette College	University of Michigan
Lehigh University	University of Missouri-St. Louis
College of Charleston	University of New Hampshire-Main
Louisiana State University	University of North Carolina at Chapel Hill
Loyola University Chicago	University of North Carolina Wilmington
Marquette University	University of North Texas

Massachusetts Institute of Technology	University of Notre Dame
Miami University-Oxford	University of Pennsylvania
Michigan State University	University of Pittsburgh-Pittsburgh
Michigan Technological University	University of South Carolina
Mississippi State University	University of South Florida System
Missouri State University	University of Southern California
New Jersey Institute of Technology	University of Texas at El Paso
North Carolina A&T State University	University of Virginia-Main Campus
North Carolina State University at Raleigh	University of Washington
North Central College	University of Wisconsin-Madison
Northeastern University	Valdosta State University
Northwestern University	Villanova University
Ohio State University	Virginia Commonwealth University
Ohio University-Main Campus	Wake Forest University
Oregon Health & Science University	Washington State University
Oregon State University	Wayne State College
Penn State University	Washington University in St. Louis
Purdue University	Webster University
Rensselaer Polytechnic Institute	Wellesley College
Rice University	Wentworth Institute of Technology
Rochester Institute of Technology	West Virginia University
Rollins College	Western Illinois University
Rutgers University	Worcester Polytechnic Institute
Southern Methodist University	Wright State University-Main Campus
Stanford University	

### **NACRO Member Survey Question on Collaboration Factors**

Following up on NACRO's White Paper *The Five Essential Elements of a Successful Twenty-First Century Corporate Relations Office (CRO)*, please share your insight on the presence of the following factors on your campus. Provide answers on a scale of 1-5, 1= no presence of this factor and 5= highest levels.

#### Essential Elements

- 1- Institutional Support (University president empowers the CRO and encourages leadership and faculty to collaborate with the CRO. Leadership is enthusiastic, participates in industry partnerships, and promotes group cohesion and team effectiveness )
- 2- Mutual Benefits (CRO identifies and matches company's strategic needs and university's strengths, design projects/initiatives to meet shared goals. Company displays desire and eagerness maintain and strengthen a valued partnership.)
- 3- One-stop Shopping (Single point of entry where companies are guided to relevant campus resources. CRO works with external and internal partners to overcome barriers to corporate engagement. CRO facilitates access to the entire university (not a gatekeeper.)
- 4- Integrated Approach to Research Development (CRO identifies/actively establishes sponsored research projects with corporations. Facilitate collaboration with corporations to pursue government research grants to develop new core technologies.)
- 5- Campus Coordination (Open and frequent communication with corporate partners. CRO organizes meetings to coordinate interactions throughout campus. Manage an internal database to gather and share corporate data/engagement with relevant campus offices. )

#### Collaboration Insight

- 6- Trust (Highest levels = company fulfills its obligations, continuity in relationship, mutual need and benefit, insight into company's vision/future)
- 7- Conflict (Highest levels =conflict over IP, curriculum, faculty, students, power imbalance, lack of clear roles and expectations, lack of harmony and agreement in the partnership, ineffective conflict resolution)

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## **BIOGRAPHICAL SKETCH**

Jessica Shepard Watts was born in Miami, Florida, and lived in Yokohama, Japan and Eagan, Minnesota before settling in North Texas. She graduated summa cum laude from The University of Texas – Arlington with a bachelor’s degree in Political Science and was a member of the UTA Division I Tennis Team. Watts earned her master’s degree from The University of Texas at Dallas in Public Affairs before pursuing her PhD in the same program.

Professionally, Watts serves as Executive Director of Corporate and Foundation Relations at the University of North Texas (UNT), where she leads enterprise-wide engagements with industry and foundations. In a central office, her team manages philanthropic and research partnerships that engage companies and foundations across fourteen academic schools and 35 centers & institutes.

Prior to UNT, she spent six years at The University of Texas at Dallas, most recently leading the central corporate relations team as Senior Director of Corporate Relations. Watts began working in higher education in 2012 after six years at the United Way of Metropolitan Dallas, where she managed the largest corporate giving campaigns and a portfolio of major gift donors.

A public servant at heart, Watts has served on several nonprofit, chamber, and organization Board of Directors.

Personally, Watts is married to Bradley and the proud mother to Grace, and the baby boy due in a few weeks, as well as her furry furst babies, Bella and Bear.

**CURRICULUM VITAE**  
JESSICA WATTS  
JJSHEPARD@GMAIL.COM

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**EDUCATION**

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The University of Texas at Dallas 2019  
*Ph.D. in Public Affairs, 4.0 GPA*  
*Dissertation Topic: Navigating the Partner Landscape – Understanding the Impact of External Resources and Partners on Universities in the Modern Economy*

Association for Research on Nonprofit Organizations and Voluntary Action (ARNOVA)  
Presented research papers: *Revenue Diversification at Public Higher Education Institutions* (2018), *Alumni Giving through a Student Phonathon Program* (2016) and *The Dallas Entrepreneur Center: An Impact Analysis on a New Model of Entrepreneurial Support Organization* (2016)  
Association for the Study of Higher Education (ASHE), Member and Conference Attendee

The University of Texas at Dallas 2010  
*Master's Degree in Public Affairs*  
Graduated with High Distinction, 3.905 GPA

The University of Texas-Arlington 2006  
*Bachelor of Arts in Political Science*  
Summa Cum Laude, Member of Pi Sigma Alpha (Political Science Honor Society)  
NCAA Division I Women's Tennis Team, Dean's List, Scholar Athlete

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**PROFESSIONAL EXPERIENCE**

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University of North Texas, Denton, Texas  
*Executive Director of Corporate & Foundation Relations* July 2018 – present

- Lead the central corporate and foundation relations team, Facilitate corporate and foundation engagement with 13 schools, centers, research, and student affairs
- Secure \$9M+ in annual support from corporate and foundation partners
- Build strong partnerships with Cabinet, Deans, Chairs, Research and Center Directors
- Established best practices including engagement summaries and briefing templates, corporate strategy sessions, formalized proposal templates and processes, provided structure for industry engagement

The University of Texas at Dallas, Richardson, Texas  
*Senior Director of Corporate Relations* January 2016 – July 2018  
*Director of Corporate Relations* January 2012 – 2015

- Led central corporate relations team, primary entry for corporate engagement on campus
- Manage largest and most comprehensive corporate partnership, averaging \$2M+ in annual unrestricted research funding and varying philanthropic support

- Manage the top 15 corporate partners
- Built four partnerships from little engagement/\$0 giving, to sustained engagement and \$80k-\$200k+ annually
- Cultivated and closed a \$1M naming opportunity in Davidson - Gundy Alumni Center
- Consistently close \$3M+ in funding annually to the university
- Launched Corporate Open House featuring engagement opportunities including research, recruiting, student projects and diversity. 2018 Attendance: 180/100 unique companies
- Grant writing, coordination and submissions to corporate foundations

United Way of Metropolitan Dallas, Dallas, Texas

June 2006 - January 2012

*Director of Women of Tocqueville*

July 2011 - January 2012

*Development Officer*

June 2006 - July 2011

- Managed Women of Tocqueville (WOT), an affinity group of over 170 female executives and community philanthropists giving over \$10,000 annually
- Recruited 30 new WOT: most new members recruited in a single year in the group's 5 year history. Managed WOT committee, executed volunteer and networking events
- Foster relationships to further development and fundraising productivity
- Develop great relationships with key volunteers, donors and specialized committees
- Strategic account development and collaboration to capitalize on giving potential
- Create, edit communications including talking points, event invitations and letters
- Campaign Results: managed a \$3.3M state-wide coordinated campaign, Consulting Campaigns (raising \$2.9M+, a 3% increase annually), the 5<sup>th</sup> largest account raising \$2M - a 8% increase in employee giving and a 7% increase in \$1,000+ donors from 352 to 377, Law Firm campaigns (raising \$1.5M+)
- Recruit and manage Executive Volunteers on division strategies and areas for growth

Office of U.S. Representative Lloyd Doggett, Washington, D.C.

January - May 2006

*Congressional Health Fellow*

- Updated constituent database and drafted constituent relations
- Reported on congressional briefings, researched health polciies, and submitted findings to the Congressman

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## ACHIEVEMENTS/CIVIC INVOLVEMENT

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- ARNOVA Pracademic Section Leadership (2018- present)
- Leadership Richardson Class XXVIII, Richardson Chamber of Commerce, 2012-2013
- Bill Archer Fellowship, Washington, DC, Spring 2006  
*Competitively selected as one of 22 UT System students for a public policy fellowship.*
- Other/Past Affiliations: Bill Archer Fellowship Alumni Board (2015-2017), NACRO Executive Committee: VP, President, Past President of the Board (2016 – 2019), Women in Leadership Committee, City of Richardson Chamber (2013 – 2018), Richardson Adult Literacy Center, Board Member (2015 – 2018), Dallas Running Club, Canyon Creek Crime Patrol (2009-2018), United Way Leadership Society Member (2007-2013)