

Three Essays on Contracting Out Local Health Services:

Determinants and Outcomes

BY

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THESIS

Submitted as partial fulfillment of the requirements
for the degree of Doctor of Philosophy in Public Administration
in the Graduate College of the
University of Illinois at Chicago, 2020

Chicago, Illinois

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To my parents Caifeng Wang and Jun Zhao for their love and support.

ACKNOWLEDGMENTS

It is an honor to recognize the many individuals who contributed to the completion of this dissertation. No simple words can describe my sincere gratitude for my committee chair, Dr. Kelly LeRoux. She is in all respects a remarkable individual and insightful scholar who has made my doctoral study wonderfully stimulating and enjoyable. She took me under her wings and is always kind and supportive. I am very fortunate to have her as my advisor and I look forward to her continuing guidance as I embark on the next phase of academic career.

I am deeply appreciative of the members of my dissertation committee, Dr. Timothy Johnson, Dr. Jered Carr, Dr. Jiaqi Liang, and Dr. Jaclyn Piatak for providing many helpful comments and suggestions on my dissertation. Dr. Timothy Johnson served as a great advisor in my first three years and provided continuous help throughout my doctoral journey. I owe a special thanks to him and I will always be grateful for his patience and guidance. I especially appreciate Dr. Jered Carr for his advisement and support that I received. Dr. Jiaqi Liang shows me a wonderful example of young scholar and I have benefited a lot from working with her. I am also thankful for Dr. Jaclyn Piatak's invaluable advice on my future research.

I would like to thank my professors who walked me through my past six years. Dr. Yonghong Wu and Dr. Thomas Snyder served as my incredible supervisors and showed their concerns for my growth in the program. I would express my gratitude for their tremendous support. I would also like to thank Dr. Allyson Holbrook, Dr. James Thompson, and Dr. Michael Siciliano for their excellent instruction. Their courses that I have taken have inspired my

ACKNOWLEDGMENTS (continued)

academic development. The very first research design that I wrote in this program focused on contracting out which was suggested by Dr. James Thompson. My ending dissertation perfectly echoes my beginning in public administration research.

Thanks also to my amazing fellows in this PhD program for the time we spent together. Dr. Xiaoheng Wang has provided huge support and encouragement in my doctoral years. I feel so grateful to have her as my good friend. I would like to thank Dr. Andy Crosby, Dr. Yu Shi, and Dr. Shu Wang for their great friendship, helpful suggestions, and ceaseless support since I joined this program.

I cannot avoid personally thanking Dr. Elisabeth Muhlenberg. She always cares about me like a family and changed my life. I would also like to thank my childhood friend Ying Fan, my close friends Dr. Haiqing Song, Dr. Dan Yi, Dr. Keke Lin, Dr. Jiaxuan Zhang, and Dr. Jing Wang for filling my life with delicious food, care, laugh, and happiness.

My most special thank you is for my mother Caifeng Wang and my father Jun Zhao, who have always encouraged me to pursue my own goals. I would never have completed the program without their unwavering dedication, support, and love. I contend this work is as much theirs as it is mine.

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LIST OF ABBREVIATIONS

APHA	American Public Health Association
CDC	Centers for Disease Control and Prevention
CHRR	County Health Rankings & Roadmaps
FTE	Full-Time Equivalent
GAO	General Accountability Office
ICA	Institutional Collective Action
ICMA	International City/County Management Association
IOM	Institute of Medicine
LHD	Local Health Department
NACCHO	National Association of County and City Health Officials
PHAB	Public Health Accreditation Board
RRR	Relative Risk Ratio
STD	Sexually Transmitted Diseases
STI	Sexually Transmitted Infections

SUMMARY

Driven by New Public Management and Government Reinvention principles, contracting out for many types of public services, including health care has become commonplace, particularly at the local level where fiscally constrained municipalities and counties have sought ways to keep up with increasing service demands in the face of declining resources.

This dissertation, comprised of five chapters including three essays, elucidates the determinants and outcomes of contracting out local public health services through the practices in local health departments (LHDs). This study concentrates on several research questions: (1) Why would local public health agencies choose the alternative of outsourcing rather than in-house delivery? (2) What factors influence the buy-or-not-buy option? (3) What factors account for the buy-more-or-less alternative? (4) What service characteristic affect the make-or-buy decision? (5) How do the contracting activities affect local health outcomes at the community level? This study addresses these questions through a multi-method study examining relationship between possible factors and the make-or-buy decision, as well as correlation between outsourcing activities and specific health issues.

Chapter 1 first introduces definition, historical development, benefits as well as challenges of contracting out/outsourcing. Then it focuses on contracting out public health services in local health departments and proposes research questions. This chapter also briefly describes some prevailing schools of thought in government contracting literature.

Chapter 2 (essay 1) explores the environmental, nonprofits, and management determinants of the outsourcing decision through two-factor model. The results present two-stage decision making. The buy-or-not-buy decision is influenced by institutional and fiscal pressures and management factors. The buy-more-or-less decision is affected by political pressure and the density of nonprofits.

Chapter 3 (essay 2) examines how two transaction cost dimensions, asset specificity and service measurability, impact the outsourcing decision through multinomial logistic regression model. The results indicate that local health departments increase in-house production when asset specificity and service measurability move from low to moderate levels, and then reduce complete internal production when transaction costs reach very high levels.

Chapter 4 (essay 3) investigates the health outcomes of contracting activities among local health departments (LHDs). This analysis identifies four specific health issues—frequent mental distress, sexually transmitted infections, teen births, and adult smoking. The findings suggest that contracting out health services with lower asset specificity and easier service measurability, or lower transaction costs, are more likely to generate better health outcomes.

Chapter 5 concludes that this study of contracting out is important because it has both theoretical and practical implications for local health departments. As the findings throughout this dissertation suggest, multiple theories prescribe important roles of institutional, nonprofit, management, and transaction cost factors in predicting the make-or-buy decision in LHDs. This

study also provides empirical evidence that outsourcing can improve certain public health outcomes. The findings from this dissertation can help to shape what we know about outsourcing in the public sector and advance the practices in public health agencies in the future.

1. INTRODUCTION

1.1 Statement of Problem

1.1.1 Definition of Contracting Out/Outsourcing

Driven by New Public Management and Government Reinvention principles, contracting out or outsourcing public services has been widely used in recent years. In 2018, the U.S. government spent \$4.11 trillion (USASpending 2019). According to the U.S. Government Accountability Office (2019), “About 40% of the government’s discretionary spending goes to contracts for goods and services covering everything from health care to hand grenades. In fiscal year 2018, the federal government spent more than \$550 billion on these contracts, an increase of more \$100 billion from 2015.” “Today, citizens receive public goods and services not only from their general-service local governments, but also from a variety of vendors working under contract, including for-profits, nonprofits, and government agencies from other jurisdictions” (Brown and Potoski 2003a, 153).

Contracting out or outsourcing refers to the means that “the government entity retains ownership and overall control but employs the private vendor to actually deliver the service” (Seidenstat 1999, 7). To be specific, contracting out describes the process that federal, state, and local governments financed by tax collections, purchase goods or services from either for-profit or nonprofit organizations or other government jurisdictions instead of delivering the service through a government unit’s own personnel (DeHoog 1984; Levine 1990; Pascal 1980).

Under the approach of contracting out, the government remains the financier, sets the standards, entails a competition among bidders, assesses potential candidates, signs agreement with contractors, monitors contract performance, and replaces contractors that do not perform well (Auger 1999; LeRoux 2007; Seidenstat 1999; U.S. Government Accountability Office 1997). In many cases the two terms “outsourcing” and “contracting out” have been used interchangeably, though “outsourcing” is often used as an economic concept to indicate the use of external (foreign or domestic) sources by firms to capitalize on their core functions while minimizing non-core business activities. Typically, the term “contracting out” tends to be more commonly used in the public sector (Hall 2000). The two terms will be used as synonyms throughout the following chapters.

1.1.2 Historical Development of Contracting Out

Contracting out serves as the dominant alternative to in-house production of public services. The choice of contracting out reflects historical, practical and theoretical considerations. The private production of government services has had a long history since the Colonial period (Moe and Stanton 1989).

The earliest practice of contracting out public services predated the founding of the United States (Fernandez, Ryu, and Brudney 2008). Since the outset of the Republic, the government has exercised a narrow range of functions and relied on the private sector to provide basic services for citizens (Levine 1990; Moe 1987; Ni and Bretschneider 2007). During

the Colonial period, local government provided subsidies to private individuals, as practices in England, to control the poor rate and offer care for the frail and ill (Giovannoni 1982; Levine 1990). As a norm, “the Colonial overseer of the poor contracted out service for the poor by granting awards to the lowest bidding town resident willing to provide food and shelter and to the lowest bidding physician able to provide medical care” (Abramovitz 1986, 257; Friedländer 1955). From Colonial times to the New Deal, the government sought a balance between demanding liberty and promoting the general welfare (Kettl 2015).

Gradually, government became bigger. From the New Deal to the Great Society, governments collected growing revenues and government-operated programs became common (Abramovitz 1986). Government expenditures on contracting out military hardware, infrastructure projects during the Depression, post-war public housing, mental health services, and other public programs kept rising. Governments continued employing contracting out but extended the ranges and categories.

In the 1970s, the optimistic atmosphere of the Kennedy/Johnson years with economic prosperity and the Great Society programs was diminishing. Instead, it can be characterized as a decade of doubts and self-examination at all levels of American governments (DeHoog 1984; Salamon and Lund 1984). Given the changing environment, the interest in contracting out blossomed, stimulated reappraisals of service provision, and made it become a hot topic in local government circles (Ascher 1987). “Contracting out was institutionalized by the General Revenue Sharing Act (1972)” and several other federal laws (Abramovitz 1986, 257).

“The Reagan Administration took office in 1981 with a well-articulated set of objectives: reduce the size, scope, and influence of the federal government in American life” (Carroll 1987, 107). The 1980s saw a privatization movement and an explosion in contracting out of public services. “In response to these changes in the fiscal and political environment, local governments are rethinking the ways in which they deliver services. Contracting out is the alternative considered most frequently” (Ferris and Graddy 1986, 332). Practically, government officials can “retain substantial control over service production while seeking the lower costs or improved performance promised by private sector producers” (Seidenstat 1999, 7). “In the case of poor performance by the private producer, contracting out offers a degree of reversibility not available with other forms of privatization” (Johnston and Seidenstat 2007, 231).

In the 1990s, state and local government economy began to recover from recession. However, soaring deficits, fiscal restraint and declining public confidence in the ability of government agencies to accomplish public needs urged public management reform to dominate this period (Avery 2000; Benton and Menzel 1992; Hirsch 1991, 1995; Kodrzycki 1998; Seidenstat 1999). The inefficiency in large-scale “Great Society programs and Reagan’s market solutions” to issues of governance “have fundamentally transformed” how federal, state, and local governments think and behave (Brown and Potoski 2003b, 442). As a response, the Clinton administration’s management reform, spurred by Osborne and Gaebler’s *Reinventing Government* (1992), initiated a reinventing government movement across the country.

Under both global trend of New Public Management reform and domestic reinventing government movement, public managers were forced to reexamine themselves, rethink service delivery practice, and reduce inefficiencies in their operations (Auger 1999; Avery 2000; Hefetz and Warner 2004; Ni and Bretschneider 2007; Potoski 2008). “Governments at all levels have increasingly turned from direct service providers and producers to relying on a host of external actors—nonprofits, private firms, volunteers, and other governments—to produce traditional public services and functions” (Kettl 1993, 246). “Although governments remain the dominant producers of public services”, contracting out is extensively growing (Behn and Kant 1999; Brown and Potoski 2003b, 442; Warner and Hebdon 2001). People debated on whether the public sector and the private sector are inherently different, and whether public agencies can compete with private firms and organizations to achieve higher efficiency and effectiveness.

After the economic prosperity in the 1990s, the 2001 recession and the 2008 financial crisis aggravated the imbalance between limited fiscal resources and increasing citizen expectations. The public sustain considerable dissatisfaction with big government and their distrust toward the federal government in polls has been rising from 35 percent in 1965 to 72 percent in 2013 (Jones 2013; Kettl 2015). Faced with such a reality, many local governments have turned to service contracting as a “quick-fix” remedy for these problems (LeRoux 2007).

1.1.3 Benefits and Challenges of Contracting Out

Despite contracting out being broadly applied at all levels of governments, there are extensive disputes and disagreements with the practices in the past decades. Contracting out service delivery may have both potential benefits as well as risks. In terms of the advantages of contracting out, the major one should be efficiency gains or cost savings (Ferris and Graddy 1986; Fisk, Kiesling, and Muller 1978). Many public services often are criticized as being neither cost efficient nor delivery effective (Davis et al. September, 1989). Largely due to budgetary constraints, constituency resistance to higher taxes, and citizen demands for higher quality services, states and cities seek increasing use of contracting out to deliver public goods and services to citizens. Supporters suggest that through scale economies, sector differences in labor practices, and market competition, the private sector can realize better government at a lower price (Bennet and Johnson 1981; Ferris and Graddy 1986). Contracting out can provide cost savings and achieve desired efficiencies (Botkin 1999). A survey with city managers showed that in general the level of satisfaction with municipal contracting was fairly high (DeHoog and Stein 1999).

Moreover, those who support contracting out the delivery of governmental goods and services contend that the benefits also include limiting the growth of government, avoiding large initial costs, permitting greater flexibility, providing better managerial skills, generating instant responsiveness to the public, investing in capital assets, reducing government debts, and

performing multiple goals (Bennet and Johnson 1981; Botkin 1999; Fisk, Kiesling, and Muller 1978; Savas 1982, 1987, 2000).

The potential boon for state and local governments through contracting out, nevertheless, is not always the case. Contracting out is not a panacea for government cost savings. Simple contracting out is a narrow view (Davis et al. September, 1989). The empirical evidence on the cost-effective contracting out in distributing and delivering services tends to be mixed. The cost savings of contracting out vary considerably across types of services as well as states and cities. Researchers disagree not about whether the advantages exist but regarding how stable contracting out works and why the effects of contracting out vary substantially by services and areas. Opponents claim that cost savings from contracting out may be overestimated. Contracting out could also lead to inefficiency because of possible higher costs from (1) monopoly by single private contractor, (2) private autonomy, (3) private contractor charging higher prices, (4) associated transaction costs, and so on (DeHoog 1984; Levine 1990). Contracting out may cost more with these drawbacks or disadvantages rather than less as expected (Fisk, Kiesling, and Muller 1978).

Other possible limitations in terms of contracting out cover government responsibility, equity, and corruption. First, governments increasingly relying on contracting out may generate “hollow states” (Brown and Potoski 2003b; Fredericksen and London 2000; Milward and Provan 2000; Milward, Provan, and Else 1993). Service delivery through external actors has become very common at all levels of governments. However, contracting out may reduce government’s

ability to monitor or even cause government lose control over the service delivery process.

Therefore, some worry about governments to be “hollow states”. Second, governments may lose constitutional responsibilities while contracting out service delivery. Little attention has been focused on the potential impact of contracting out on citizen rights, access to public services, and related equity issue resulting from abuses of the private sector (Sullivan 1987). This problem relating to public accountability can also be viewed as a paradox enshrined in the Constitution that demands liberty but commits general welfare for people (Kettl 2015). Third, the process of contracting out may produce corruption (DeHoog 1984; Levine 1990; Preker and Harding 2007). Corruption in public projects and programs may not be eliminated through contracting out. On the contrary, contracting out may intensify corruption by rewarding politicians’ supporters, creating illicit bidding, and building cozy relationships between public manager and contractor.

Thus, contracting out is not a panacea and must be entered into thoughtfully and carefully (DeHoog and Stein 1999). Government officials and public managers should consider service complexity, contracting specification, and the ability to monitor contracting relationship and whether contracting yields good service outcomes for the public. Systematic analysis is needed for contracting out specific services to determine what factors contribute to the make-or-buy decision for contracting out and how contracting out promotes service performance.

1.1.4 Contracting Out Public Health Services in Local Health Departments

In 1988, the Institute of Medicine (IOM) in its milestone report *The Future of Public Health* defined the mission of public health as “fulfilling society’s interest in assuring conditions in which people can be healthy” (Institute of Medicine 1988, 7). Given the focus on the management of health in population rather than the care of individual patients, public health is a much more complex set of tasks revolving around “the activities of the detection, prevention, treatment, control, intervention, surveillance, and assessment of health threats” (Avery 2000, 332). Although government contracting has been growing fast for many public services, it is not the case for public health services in local health departments. According to the 2016 National Profile of Local Health Departments , only 16% of all local health departments contract out for more than five public health services among 85 services. In addition, less than 10% of all local health departments contract out the public health services that have been consistently contracted out since 2005. Although studies have examined the role of contracting out in public services in the public administration literature, no studies concentrate on public health services. Given the importance of public health in ensuring the well-being of the nation, this study puts a focus on contracting out public health services in local health departments.

Governmental agencies at every level—federal, state, and local—represent an important component of public health services (Teitelbaum and Wilensky 2013). Although under the Constitution, the states have the primary responsibility for the well-being of their citizens, health services must be delivered locally (Institute of Medicine 1988). The local health

department (LHD) is “an administrative or service unit of local or state government concerned with health and carrying some responsibility for the health of a jurisdiction smaller than the state” (National Association of County and City Health Officials 2005). “Local health departments (LHDs) have a fundamental and complex role as the front line for delivery of basic public health services to most of the communities in this country. There are almost 2,800 local health departments in the United States, varying dramatically in geographic size, size and nature of population, urban and rural mix, economic circumstances, governmental structure within which they work, and governing organization to which they are accountable” (Hernandez, Rosenstock, and Gebbie 2003, 145). LHDs work every day to ensure the safety of water and food, prevent people from getting sick, take actions on public health emergencies, promote wellness by encouraging healthy behaviors, and protect the well-being for “all people in their communities where they live, learn, work and play” (American Public Health Association 2019; National Association of County and City Health Officials 2018). LHDs are key partners in the design, implementation, and reform of the broad range of health service programs. LHDs have a strong voice in sharing federal and state grants and providing most needed services, though varying in jurisdiction and authority.

In recent years, whereas LHDs would undertake overall responsibility to deliver as many as 85 kinds of public health services, they are confronted with complex social and behavioral problems, expanded population health needs, rapid disease transmission across national boundaries, fiscal constraint, budget pressure, and diminished capacity (Reich 2002). “The

majority of local health departments provide a wide variety of services to very diverse communities with limited resources and too few staff (the median size is 14 full-time equivalents)” (Hernandez, Rosenstock, and Gebbie 2003, 145-146). According to the 2016 profile report by the National Association of County and City Health Officials (NACCHO), most LHDs are county-based or serve multiple counties, while one-fifth of LHDs serve cities or towns, particularly in New England (National Association of County and City Health Officials 2017a). The NACCHO lists 10 categories of activities including 85 specific services that LHDs may deliver (please see Appendix A for details):

1. Immunization
2. Screening for diseases/conditions
3. Treatment for communicable diseases
4. Maternal and child health
5. Other health services
6. Epidemiology and surveillance activities
7. Population-based primary prevention activities
8. Regulation, inspection and/or licensing activities
9. Other environmental health activities
10. Other activities

As shown in figure 1, over time, more LHDs have reported budget cuts, or lower budgets compared to the previous fiscal year, particularly from 2008 to 2015

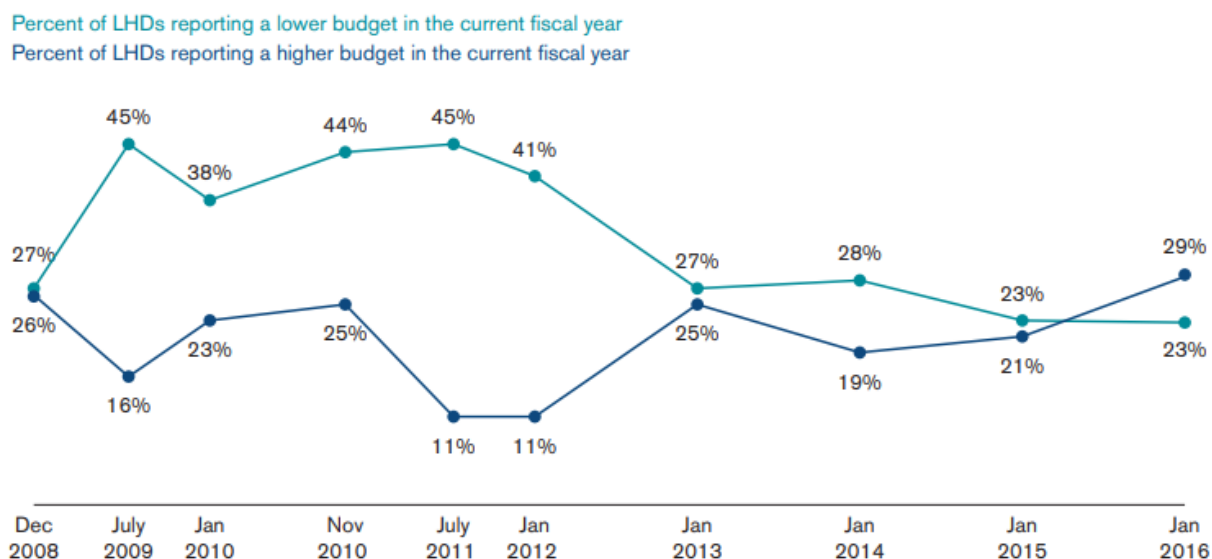


Figure 1. Budget changes of local health departments over time (2008-2016)

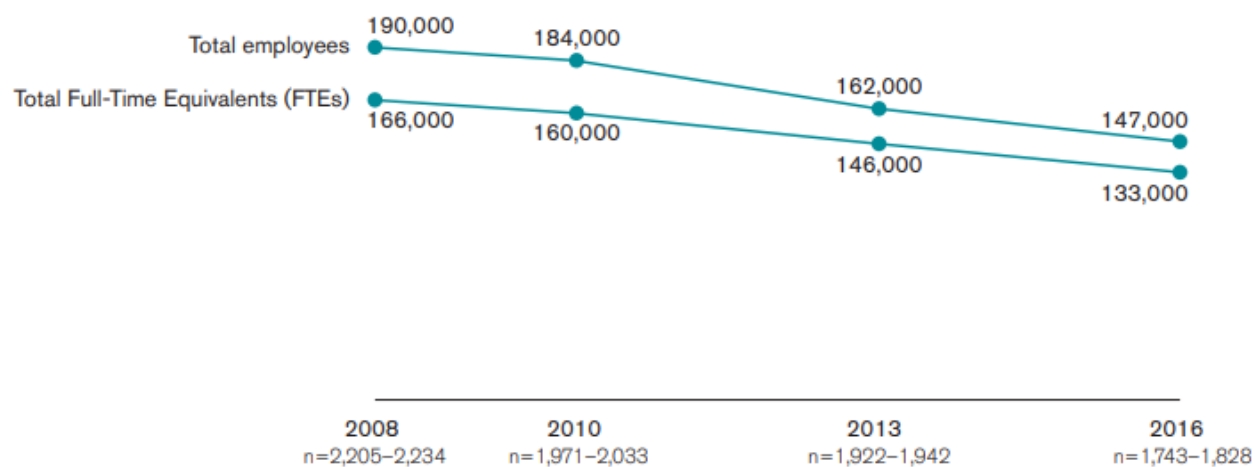


Figure 2. Estimated size of workforce in local health departments overtime (2008-2016)

Source: 2016 National Profiles of Local Health Departments

(National Association of County and City Health Officials 2017a). Meanwhile, as figure 2 exhibits, the estimated numbers of LHD employees and full-time equivalents¹ (FTEs) have decreased by 23% since 2008. On the one hand, many LHD directors insist that LHDs should be responsible for the health of the public and worry about losing control and capacity through contracting out. On the other hand, however, LHDs have been facing declining financial and human resources, and growing population. With less resources for utilization and more people to serve, how LHDs would maintain the service quality and protect the well-being of local residents will be a central issue for not only public health experts but also public management scholars.

Local public health departments have been seeing soaring health expenditures since the 1960s. “Public health agencies are funded through a combination of federal, state, and local funds, as well as county and city revenues” (Centers for Disease Control and Prevention 2013). In the past decade, the economic downturn resulted in deteriorated tax base for state and county general revenues, which may create an incentive for LHDs to engage in more contracting practices. In the meanwhile, the implementation of the Affordable Care Act required a more complex role for states and local public agencies. The changing environment enacted a variety of solutions including contracting out more health services to private firms and nonprofit organizations as well as intergovernmental collaboration (Issel et al. 2015).

¹ In the Profile of Local Health Departments, LHDs “count a full-time employee as 1 FTE (Full-time equivalent), a half-time employee as a 0.5 FTE” (National Association of County and City Health Officials 2017a, 24).

In the history of public health, the private sector has been actively participating in providing for-profit professional care for a long time. The privatization in public health is not a recent management tactic, although its application in certain areas is relatively new (Surpin and Weidman 1999). “The public sector together with private and voluntary organizations and individuals undertake commitment to assuring the conditions in which people can be healthy” (Institute of Medicine 1988, 7). Thus, the current definition of public health system encompasses both the governmental and nongovernmental entities (Gollust and Jacobson 2006; Institute of Medicine 1988). Yet, LHD directors showed distinct attitudes toward nonprofit and for-profit organizations as contractors. Some directors didn’t think there are “practical differences between for-profit and nonprofit organizations” (Keane, Marx, and Ricci 2002, 1252). Others, however, “believed that for-profit organizations lack a commitment to public health” and preferred nonprofits as service vendors (Keane, Marx, and Ricci 2002, 1252).

Although some scholars argue that the private sector can deliver public goods and services more efficiently and effectively than the public sector, “others contend that certain services such as public health services should not be contracted out to the private sector” (Keane, Marx, and Ricci 2002, 1252). In spite of the fact that over half of all LHDs contracted out for at least one health service, interviews with LHD directors across the nation reported by Keane, Marx, and Ricci (2002) find that some directors would consider contracting out more public health services while others were concerned with several issues: “it would weaken health departments’ capacity to respond effectively to disease outbreaks, undermine the ability to carry

out enforcement functions, diminish control over performance, or reduce the professional public health skill base” (1252). LHD directors need more evidence to make the contracting decision.

1.2 **Research Questions**

Over the past 40 years, the public administration and public management literature has seen relevant research in order to better understand the prevalence of contracting out in federal, state, and local public agencies. From the theoretical perspective, the prevailing schools of thought such as public choice theory, transaction cost theory, institutional collective action framework, and collaborative management theory take efforts to explain the rationales for the make-or-buy decision. From the empirical perspective, a number of studies focus on contracting out practices in all levels of governments.

Among the existing literature, there are two primary inquiries: (1) what are the determinants for the make-or-buy decision, and (2) what is the effectiveness or outcome of contracting out public services. Answers for the first question cover a variety of factors: transaction costs, fiscal stress, political pressure, management, institutional environment, and so on. Scholars have also examined the consequences of contracting such as economic costs and benefits, quality of contracting program, organizational performance, etc. This study concentrates on local health departments’ (LHDs) practices of contracting out public health services and concerns both inquiries—what factors influence the make-or-buy decision and how the contracting activities affect health outcomes.

This study examines local health departments' delivery of health services through contracting out and employs relevant theories to interpret empirical practices. The overarching research question covering this dissertation is: How do the institutional environment, density of nonprofits, and service complexity influence local health departments' decisions to contract out, the extent of contracting, and community health outcomes? The following specific research questions will be asked in three essays:

- (1) Why would local public health agencies choose the alternative of outsourcing rather than in-house delivery?
- (2) What factors influence the buy-or-not-buy option?
- (3) What factors account for the buy-more-or-less alternative?
- (4) What service characteristic affect the make-or-buy decision?
- (5) How do the contracting activities affect local health outcomes at the community level?

1.3 Prevailing Schools of Thought in Contracting Out

1.3.1 Transaction Cost Approach

Transaction cost approach, initially introduced by Coase (1937), was established by Williamson (1971; 1975; 1981; 2008) for the study of organization. Williamson (1981) defines

that “a transaction occurs when a good or service is transferred across a technologically separable interface” (552). Brown and Potoski (2003b) suggest that “transaction costs are essentially the management costs associated with either internally producing the service or buying it through contracting” (443). Williamson (1979; 1981; 1985; 1996; 2008) argues that when the degree of unpredictability of transaction outcome (uncertainty) is high, the frequency with which transactions recur (recurrence) is high, and the fixed investment that are specialized to a particular transaction (asset specificity) is large, transaction costs rise accordingly. Some research has explored transaction cost factors such as asset specificity and service measurability that may influence public officials’ decision to make or buy services.

Furthermore, Williamson (1991; 1995; 2008) proposes that the governance structure (inter- or intra-organization contracting, firms, bureaus, nonprofits, etc.) in adaption to transaction costs are bracketed by the institutional environment. Institutional environment establishes the formal rules (polity, judiciary, and bureaucracy) for the game of changes of governance structures that align with the transaction costs (Williamson 2008, 12). As figure 3 exhibits, the framework for the decision of service provision structure incorporates the factors of both institutional environment and transaction costs. In this study, I assert that institutional environment (institutional, political and fiscal pressures) exert influence on public health service delivery modes (make, buy, or mixed). Meanwhile, transaction costs decided by service characteristics such as asset specificity and service measurability also impact on the choice of service production.

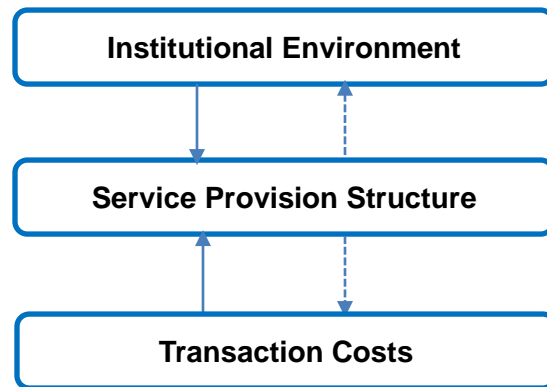


Figure 3. A theoretical framework for the decision of public service provision

Among the prior research on contracting out, the majority explore a variety of governmental functions. No studies, however, concentrate on government's public health functions. Although previous studies have advanced our knowledge of outsourcing in public services, little empirical research has examined transaction costs and institutional explanations in terms of specific public health services. Brown and Potoski (2005) and Hefetz and Warner (2011) indicate that public health programs have higher asset specificity and more difficult service measurability than other public services, which may lead to different conclusions on the subject of contracting decision and outcome. Yet, it is still not clear the role of transaction costs and institutional environment in illustrating contracting out activities in LHDs. This study will dive into public health services in LHDs and put a focus on the factors of contracting out individual services, a field where literature has yet to explore such an inquiry.

1.3.2 Contract Failure, Market Failure, and Government Failure Theories

Contract failure is an economic theory that unravels the explanations for nonprofit organizations as the preferred potential vendors over for-profit firms when contracting for certain types of services, such as some public health functions. Contract failure occurs because of information asymmetry between the seller and the buyer, that is, the service provider and recipient. The inherent complexity of public health services forges difficulty for consumers to “judge competently the quality or quantity of services they are receiving” (Hansmann 1987; Young 2012, 154). For example, in many types of health services, the consumer is unable to effectively judge the quality of the service, and in these cases, a nonprofit would be a better provider because nonprofits lack profit-maximizing incentives. As a result, the intrinsic merits of nonprofits, such as pursuing public values rather than profits, construct the preference for public agencies when contracting out.

Market failure and government failure theories emphasize the imperfection of private markets and government, and unfold the existence and important role of nonprofits as producers of public goods desired by the consumers/voters/residents. Paired with transaction cost approach, these theories can present powerful illustration in respect of the coexistent provision, joint supply, and interactive resonance among all the possible providers (public agencies, private business, the voluntary sector) in the public health service market.

1.3.3 Public Choice Theory

“Public choice arguments on bureaucracy, developed from microeconomic theory in the 1960s” (Downs 1967; Niskanen 1968, 1971; Tullock 1965), “propose that public agencies delivering public goods and services can lead to oversupply” (Boyne 1998a, 474). In the presence of competition, public agencies contracting for services can bring efficiency gains and cost savings—“for those services produced by external providers” (Averch 1990; Boyne 1998a, 474; Brudney et al. 2005; Davis et al. September, 1989; Ferris and Graddy 1986; Fisk, Kiesling, and Muller 1978; Pack 1987). Advocates of contracting out suggest that the “private sector production of public services offers an excellent opportunity for cost savings without sacrifice of services” (Bennet and Johnson 1981; Boyne 1998a, 474; Savas 1982). Yet, the empirical evidence on the cost-effective contracting out in distributing and delivering services tends to be mixed. Opponents claim that cost savings from contracting out may be overestimated (DeHoog 1984; Levine 1990).

In the arena of public health, however, saving costs may be not the most important goal that LHDs pursue. Instead, LHDs wield considerable power and hold strong responsibility for investment in expertise and long-range infrastructure to assemble health risks and to devise solutions (Institute of Medicine 2003, 102). Government’s responsibility stems from the nature of democracy (Institute of Medicine 2003, 102). Citizens always place a high priority on health and prefer quality health services, therefore health officials are more likely to be accountable to ensure public health agencies have the ability to monitor and intervene population health, rather

than reduce or remove services for costs saving (Institute of Medicine 2003, 102). In addition, many public health issues are highly complex and technical because they are constructed with a set of conflicts: inadequate provision, rising needs, social and economic influences, different values, a lot of interest groups, and inequalities. “When it comes to personal well-being, every member of a society is a stakeholder” (Brunton and Galloway 2016, 163). Given the comprehensive goals and inherent complexity of public health services, we need to figure out how contracting out could help LHDs reach those goals and what theories other than public choice theory could provide better explanation for LHDs’ contracting out practices.

1.3.3 Resource Dependence Theory

The resource dependence theory, posited by Pfeffer and Salancik (1978), argues that organizations require resources in order to survive (258). Moreover, social linkages with external organizations are important for the focal organization as a means of stabilizing the environment, reducing uncertainty, and ensuring favorable resource exchanges (713). As a result, “acquired resources may improve both the efficiency (an internal standard for evaluation) and the effectiveness (an external standard of how well organization is meeting the demands of the various organizations that are concerned with its activities)” (11).

As early as 1967, scholars and practitioners realized many complex public issues and problems need to be solved through resources across sectors (Churchman 1967; Rittel and Webber 1973; Roberts 1997, 2000, 2002; Weber and Khademian 2008a). In the past two

decades, policymakers and public managers have been seeking a variety of ways to delivering public services beyond traditional problem-solving systems through the public agencies (Kettl 2002; O'Toole 1997; Roberts 2002). Today, many pressing challenges are hard to define within a single societal sector, thus need comprehensive assessments as well as different shapes of collaboration within and across sectors. Consequently, contracting out delivery of public services has been widely used in the United States as a common means to serve citizens and deal with complex public issues.

1.4 Overview of Subsequent Chapters

There are three essays in the following chapters. Chapter 2 & 3 address the first primary inquiry concerning the determinants of the contracting choice. Chapter 4 concentrates on the second inquiry and connects the outsourcing decision with the outcome. Specifically, chapter 2 or essay 1 examines the institutional factors (institutional, fiscal, and political pressures), the density of nonprofits, as well as management factors of the make-or-buy decision in LHDs. Chapter 3 or essay 2 explores the transaction cost factors (asset specificity and service measurability) of the outsourcing decision. Chapter 4 or essay 3 applies the resource dependence theory and an extended transaction cost framework to the correlation between outsourcing and health outcomes. Finally, chapter 5 summarizes the findings in chapter 2, 3 & 4 and discusses the implications from both theoretical and empirical perspectives.

2. ESSAY ONE: INSTITUTIONAL ENVIRONMENT, NONPROFITS, AND MANAGEMENT FACTORS OF THE MAKE-OR-BUY DECISION IN LOCAL HEALTH DEPARTMENTS

2.1 Introduction

Delivering public services through contracting or outsourcing has long been used since the colonial period in the United States. However, the privatization movement did not become a prevailing issue until the early 1980s (Seidenstat 1999). Since then, outsourcing as the most common way of privatization has widely occurred in federal, state, and local governments. Over the past 40 years, the public administration and public management literature has seen relevant research in order to better understand the prevalence of contracting out at all levels of government.

From the theoretical perspective, the prevailing schools of thought such as public choice theory, transaction cost theory, and institutional collective action framework attempt to explain the rationales for the make-or-buy decision in public agencies. From the empirical perspective, many studies have examined contracting out practices in federal, state and local governments (Boyne 1998b; Brown and Potoski 2004; Brown, Potoski, and Van Slyke 2016; Dilger, Moffett, and Struyk 1997; Greene 2002; Kelleher and Yackee 2009; O'Toole and Meier 2004; Warner and Hefetz 2008). Among the existing literature, one primary inquiry explores what are the determinants for the make-or-buy decision. Contracting scholars have found a variety of factors: fiscal stress, political pressure, management, organizational structure, external environment,

and so on (Brudney et al. 2005; Dilger, Moffett, and Struyk 1997; Kraft and Clary 1991; Ni and Bretschneider 2007; O'Toole and Meier 2004; Sclar 2000; Serra 1995).

This study intends to concentrate on local public health agency contracting, which is based on “a recognition that arrangements for the provision of goods and services may be separated from arrangements for their production” (Oakerson 1999; Oakerson and Parks 1989; Oakerson and Parks 2011, 147; Ostrom, Tiebout, and Warren 1961; Parks and Oakerson 1989, 2000). Such a recognition was originated from the insight of Ostrom, Tiebout, and Warren (1961) for a more complex understanding of public service delivery since the early 1960s (Oakerson and Parks 2011, 147). As Oakerson and Parks defined in a series of research (Oakerson 1999; Oakerson and Parks 1989; Parks and Oakerson 1989, 2000), “Provision means public decisions about which goods and services to provide by public means, which private activities to regulate, how much public revenue to raise and how to raise it, what quantities of each service to provide and what quality standards to apply, and how to arrange for and monitor production. Production means transforming input resources to make a product or render a service” (Oakerson and Parks 2011, 149). The local public economies framework proposed by Oakerson and Parks, built on the key conceptual tools including provision and production, is significant for government contracting study because it states clearly that “public provision did not require public production by the same government unit...(so government can make) the choice between contracting and in-house production” (Oakerson and Parks 2011, 149; Parks and Oakerson 2000). According to Oakerson and Parks’ local public economies

framework, provision in terms of public health services by local health departments can be separated from production. Provision issues contain LHDs' decision making and accountability, while production units include various ways of delivering public health services such as direct production by LHDs, intergovernmental contracting, private or not-for-profit contracting, and many other options (Advisory Commission on Intergovernmental Relations 1987; Oakerson and Parks 2011, 149-150; Savas 1987).

This dissertation only covers provision decision making in LHDs and publicly funded production modes consisting of LHD direct or in-house production, outsourcing with LHD funding, as well as mixed delivery by LHD and contractor. Moreover, it should be noticeable that although LHDs provide many different types of clinical and population-based health programs and services, the proportion of LHDs providing these services varies greatly across the nation (National Association of County and City Health Officials 2017a). For example, 93% of LHDs provide communicable/infectious disease surveillance and 90% provide adult immunization, but only 8% provide obstetrical care and 4% provide emergency medical services. With respect to services such as obstetrical care and emergency medical services, however, it does not mean that other 90% of LHDs will certainly choose contracting. It is most likely that these services are produced and delivered by the private market and outside the scope of government provision. In other words, this study focuses only on LHD provision of public health services, some of which are produced in-house, some are produced by outsourcing, and others are produced by both.

In spite of the fact that previous studies have advanced our knowledge of determinants of outsourcing, little empirical research has examined this issue in public health agencies or local health departments (LHDs). In the U.S., federal, state, and local levels of public health agencies in the formal structure aim to fulfill society's interest in population health (Institute of Medicine 1988). Although under the Constitution, the states have the primary responsibility for the well-being of their citizens, health services must be delivered locally (Institute of Medicine 1988). In recent years, more and more health services have been transformed from states to counties or cities/towns where they are funded by federal and state governments. Every day, approximately 2,800 local health departments on the front lines of the U.S. public health system work to promote and protect the health and well-being for all people in their communities where they live, work and play, ensure the safety of water and food, prevent people from getting sick, take actions on public health emergencies, and promote wellness by encouraging healthy behaviors (American Public Health Association 2019; National Association of County and City Health Officials 2018).

Whereas LHDs would undertake overall responsibility to promote population health, they are confronted with complex social and behavioral problems, expanded population health needs, rapid disease transmission across national boundaries, fiscal constraint, budget pressure, as well as diminished capacity (Reich 2002). In the past decade, the economic downturn resulted in deteriorated tax base for state and county general revenue. In the meanwhile, the implementation of the Affordable Care Act required a more complex role for

LHDs. Those problems, pressures, and challenges created incentives for LHDs to engage in practices in order to cut down costs and maintain service quality. Such a changing environment enacted a variety of solutions including contracting out more health services to private firms and nonprofit organizations as well as other government agencies (Issel et al. 2015). Moreover, contracting can allow LHDs to enhance their focus on core public health functions, therefore may help LHDs better deliver health services through collaborative, cross-sector efforts (Green, Ingoglia, and Phillips 2004).

Some privatization theorists argue that the private sector can deliver public goods and services more efficiently and effectively than the public sector, while “others contend that certain services such as public health services should not be contracted out to the private sector” (Keane, Marx, and Ricci 2002, 1254). Outsourcing is successful in some locales but faces reluctance from other public health agencies. Why would local public health agencies choose the alternative of outsourcing rather than in-house delivery? What factors influence the buy-or-not-buy option? What determinants account for the buy-more-or-less alternative? The goal of this study is to lay out advanced understanding with respect to the determinants of the outsourcing decision in local health departments, contributes to contracting literature, and offers empirical implications for public health practitioners.

This chapter investigates these questions with the outsourcing data from the National Profile of Local Health Department Study conducted by the National Association of County and City Health Officials (NACCHO). Through two-factor model analysis, this study examines

whether the make-or-buy decisions in local health departments (LHDs) are influenced by institutional, fiscal, and political pressures, the density nonprofits/for-profits, as well as the age and education of LHD directors. The findings suggest that the decision on outsourcing rather than in-house delivery is impacted by management factors, institutional and fiscal pressures. Moreover, the decision on contracting out more rather than less services is affected by political pressure as well as the density of nonprofits (the preference for nonprofits as vendors).

In the following sections, I first review the research on the roles of institutional pressure, fiscal pressure, political pressure, nonprofits, and management factors in the outsourcing decision-making process. Then I raise theoretical arguments and hypotheses. Next, I describe the data, unit of analysis, variables, measures, and methods. After presenting the analytical results, this study concludes with a discussion of the findings, implications, and limitations.

2.2 Institutional Environment

In New institutional economics (NIE) inspired by Coase (1937; 1960), the term “institutional environment” (Davis and North 1971; Williamson, Winter, and Coase 1991) or “institution” (North 1991) refers to “rules of game: the humanly devised fundamental political, social and legal constraints that structure human interaction” (North 1991, 97). “Institutions have been devised by human being to create order and reduce uncertainty in exchange; ... institutions and the effectiveness enforcement determine the cost of transacting” (North 1991, 97-98). In Williamson’s (1995, 28) transaction cost approach, the specific institutions of

governance (inter- or intra-organization contracting, firms, bureaus, nonprofits, etc.) are bracketed by the institutional environment. Simply speaking, institutional environment establishes the formal rules (polity, judiciary, and bureaucracy) for the game of changes of governance structures that align with the transaction costs (Williamson 2008, 12). In the public sector, institutional environment also sets up the rules of game—the structure of public service delivery (in-house, contracting, mixed, etc.), which aims to reduce transaction costs. In this study, I examine the make-or-buy-or-mixed decision in local health departments under institutional, fiscal, and political pressures.

2.2.1 Institutional Pressure

One theoretical explanation for institutional pressure comes from the Institutional Collective Action (ICA) Framework which integrates multiple theories and provides an approach to understand how to cope with “a wide range of policy dilemmas in which local governing units can potentially achieve better outcomes collectively than acting individuals by reducing barriers to mutually advantageous collaborative action as represented by the transaction cost required for achieving joint projects” (Feiock 2013, 397). Within the ICA framework, networks of local governments can foster relationship and trust to develop cooperation and reduce transaction costs (Carr, LeRoux, and Shrestha 2009; Feiock 2009, 2013; Feiock and Scholz 2010).

From the perspective of institutional logic, Brown and Potoski (2003b) argue that institutional pressure results in seeking legitimacy and mimetic isomorphism. Council-manager

governments are more likely to produce services externally because they are members of the International City/County Management Association (ICMA) that advocates running cities and counties like business (448). Furthermore, contracting practices are likely to disseminate through the association in two ways: (1) member governments of the ICMA feel pressure to adopt the recommended practices; and (2) public managers voluntarily replicate the successful practices of other governments (448). As a result, institutional pressure for members in the ICMA can facilitate homogeneous activities—complete contracting (all services are contracted out) or joint contracting (not all services are contracted out).

This study argues that the make-or-buy decisions in local health departments are also influenced by institutional pressure. Specifically, those public health agencies who are members of the Public Health Accreditation Board's (PHAB's) national accreditation program are more likely to contract out health services. This program is co-funded by Centers for Disease Control and Prevention (CDC) and the Robert Wood Johnson Foundation with the aim to “assess a health department's capacity to carry out the ten Essential Public Health Services, manage an effective health department”, and “measure a public health department's performance against a set of nationally recognized, practice-focused and evidenced-based standards” (Public Health Accreditation Board 2019). “The PHAB launched the national accreditation program for tribal, state, local, and territorial public health departments in 2011” (Public Health Accreditation Board 2019). This national accreditation program establishes a relational network which represents institutional linkage, therefore may help LHDs share information in terms of requirement and

standards for public health services in order to get accredited. Within the network, local health departments can improve their service production and delivery practices through interagency communication and voluntary learning. Consequently, the program will advance and transform the quality and performance of public health departments.

In the *Standards and Measures* written by the Public Health Accreditation Board (2013), it says that, "PHAB does not intend to be prescriptive about how the health department meets the standards and measures. The health department is expected to ensure that the standards are met for the population that they serve. The focus of the standards, measures, and required documentation is that the health department ensures that the services and activities are provided to the population, irrespective of how those services and activities are provided or through what organizational structure or arrangement. Many health departments have formal agreements, contracts, or partnerships with other organizations or agencies to provide services" (4). In addition, the required documents for PHAB national public health department accreditation include contract or agreement as evidence of a formal working relationship throughout the guidance. Moreover, these supportive documents could be developed by contracted service providers, nonprofit partners and community collaborations besides local and state health departments (4).

As the standards that are developed for assessment by the PHAB emphasize that health services and activities could be provided through partnership and many health department are currently collaborating with contractors, I contend that this public health national

accreditation program facilities outsourcing services rather than in-house production. Therefore, I hypothesize that:

H1: LHDs are more likely to contract out public health services if LHDs are members of the Public Health Accreditation Board's (PHAB's) national accreditation program.

2.2.2 Fiscal Pressure

Due to the economic downturn since 2008, many local governments have seen revenue shortfalls and faced growing fiscal pressures. As a result, local governments need to decide how to deliver public services under budget constraints. Public choice theory suggests that public agencies have monopoly power in delivering public goods and services, which results in oversupply and inefficiency (Boyne 1998c; Buchanan and Tullock 1962; Stigler 1971; Tullock 1965). The solution proposed by public choice theory is to replace monopoly with competition in public service markets. "In the presence of competition, public agencies contracting for services should result in improved efficiency—cost savings or lower spending—for those services produced by external providers" (Averch 1990; Boyne 1998a, 474; Brudney et al. 2005; Ferris 1986; Savas 2000). "Contracting overcomes bureaucratic inefficiencies by allowing public organizations to access scale economies, bypasses costly labor and supply requirements, and yields efficiency gains through competition incentives" (Brown and Potoski 2003b, 154). The increasing practices of contracting out in local governments have been widely attributed to fiscal stress (Boyne 1998b). In prior research, reducing the costs of public service delivery and

mitigating fiscal stress may be the most frequently cited reason for outsourcing (Brudney et al. 2005; Chandler and Feuille 1994; Dilger, Moffett, and Struyk 1997; Ferris 1986; Ferris and Graddy 1986; Greene 2002; Van Slyke and Hammonds 2003; Warner and Hebdon 2001).

Existing empirical evidence on the relationship between fiscal pressure and outsourcing decision, nevertheless, is assorted. Boyne (1998a) reviews previous research and asserts that overall “the evidence provides little support for the view that fiscal stress is a significant constraint on decisions to contract out.” Boyne (1998b) “attributes the lack of support for this hypothesis to various factors, including poor” indicators of fiscal stress, a disregard for a match between fiscal capacity and service needs, and the fact that many local governments adopt outsourcing to improve service quality (Brudney et al. 2005, 393).

Two fiscal stress indicators, workforce and budget, were commonly used in prior research related to the contracting decision. As for the role of workforce, Brudney et al. (2005) review empirical studies as regard to service contracting across U.S. local governments and suggest that “the net impact of public employee power (on the contracting decision) is theoretically unresolved.” The impact could be either negative because there is more opposition from current employees than from other sources to contracting out (Brudney et al. 2005), or positive because the potential benefits of contracting out can be greater than risks for employees (Boyne 1998b). O'Toole and Meier (2004) use data from Texas school districts and indicate that the extent of contracting is positively associated with high levels of teacher turnover because these public schools need workforce to replace the individuals who provided the

services in the past. In other words, if we assume the customers or services are relatively stable, then “governments rely on either their own in-house workforce to do the job or rent workers by contracting with out-house professional services” (Breul 2010, s94).

As noted earlier, local health departments have seen a drop of 23% of employees from 2008 to 2016. Large LHDs (500,000+ population) have experienced a greater loss in workforce capacity since 2008 than medium (50,000-499,999 population) or small (<50,000 population) LHDs. On average, LHDs employ 57 employees and half of LHDs employ fewer than 18 employees in 2016 (National Association of County and City Health Officials 2017b). Meanwhile, LHDs may provide as many as ten categories, 85 different types of clinical and population-based programs and services in local communities. As a result, LHDs without enough workforce corresponding to the health services needs of local residents may seek additional professionals and expertise through contracting out in order to reduce the workforce pressure and maintain the service quality. Hence, I hypothesize that:

H2: LHDs are more likely to contract out public health services with lower ratio of workforce to population.

Approximately 40% LHDs faced budget cuts from 2009 to 2012 mainly due to the 2008 economic crisis and reduced government revenues. In recent years, fewer LHDs have reported budget cuts with economic recovery and slowly increased budget. according to public choice theory, LHDs with lower budget can seek outsourcing services to alleviate the burden and

maintain the current services. On the other hand, however, local health departments with less budget can also choose to cut down services rather than contract out because the costs of selecting and managing vendors may be larger than expected. Thus, LHDs with less budget may not be able to spend time, personnel and funding on processing and monitoring contracts. In this study, I argue that LHDs are likely to rely on their own resources for service provision with less budget. Therefore, I hypothesize that:

H3: LHDs are more likely to produce public health services in-house with less budget.

2.2.3 Political Pressure

Although public choice scholars advocate the advantage and application of contracting to the public sector, the buy decision may be challenged by political pressure. Three population subgroups have been examined in empirical studies to show strong preference for the role of government: “black citizens and low-income individuals favor a larger role for government and thus oppose privatization of public service delivery; while the elderly favor a smaller government” (Brudney et al. 2005, 393; Morgan and Hirlinger 1991; Thompson and Elling 2000). These local citizens/taxpayers/voters may exert distinct pressure on the elected officials’ decision to contracting out (Lowery 1982).

The more recent work uses minority groups rather than only African Americans to capture population diversity and potential for diverse policy preferences. Thompson and Elling (2000) argue that whites are more likely than nonwhites to feel that government has too much

power and therefore expect privatization of service production and delivery. On the contrary, minorities may be more likely to be sensitive to the implications of outsourcing and may even feel threatened by privatization of public services because they are often more dependent upon the public sector for jobs.

H4: LHDs are more likely to contract out public health services with less minority population within the jurisdiction.

Services for the elderly are among the most commonly contracted out social services (Feiock and Jang 2009; Schmid 2003; Van Slyke 2002). People may demand more personal health care services as they are getting older. Nonetheless, health care services for older people require trained personnel, specialized instruments and other investments that public health agencies may not be able to afford. In addition, older people are more likely to become conservative in political ideology and not favor a larger government. Thus, they may support reducing in-house production and turning to external provision.

H5: LHDs are more likely to contract out public health services with larger population older than 65 within the jurisdiction.

The size of low-income residents may also affect the officials' decision with respect to whether or not produce municipal service directly (Ferris 1986; Ferris and Graddy 1986; Greene 2002; Hirsch 1995; McGuire, Ohsfeldt, and Van Cott 1987). Wealthier jurisdictions are more likely to contract out because they seek higher quality services. "More affluent individuals may

be especially sensitive to the costs of public programs because they pay more taxes and they believe that they have little need for many of the services financed by the taxes they pay” (Thompson and Elling 2000, 338). Besides, Thompson and Elling (2000, 338) argue that “those with higher incomes are more likely to be Republicans and conservatives, thus oppose more in-house production”. In contrast, poor communities cannot afford higher quality and expendable services. Low-income constituents would accept lower-cost and lower-quality product supplied by the public sector (Lindsay 1976). Morgan, Hirlinger, and England (1988) find that it is less likely for a municipality to enter into agreements with external service provider with a higher percentage of lower- and middle-income population. Additionally, low-income citizens may prefer local in-house production in that they expect government has a higher commitment to the service delivery. Hence, I hypothesize that:

H6: LHDs are more likely to contract out public health services with less low-income population within the jurisdiction.

2.3 Nonprofits as Competitive Contractors

“Competition is one of the most frequently cited factors relating to successful contracting” and is often looked as one of the advantages in a market economy (Brudney et al. 2005, 393; Greene 2002; Hodge 2000; Kettl 2011; Savas 1987, 2000). Basically, Williamson and public choice scholars point out similar rationales concerning competition in contracting. Williamson (1981) mentions competition when introducing behavioral assumptions. He suggests

that an economic agent's bounded rationality and opportunism could be alleviated if "effective ex ante and ex post competition can both be presumed" (554). The rationale of effective ex ante market competition lies in the large numbers of qualified bidders at the outset of contract as the sources of natural selection pressures, which can autonomously deal with complexity in contract and result in efficacious trading. Moreover, ex post market competition can reduce disparity between bidding winners and nonwinners during contract execution and particularly effective at the contract renewal interval. Based on a large body of public choice research, Lowery (1982) summarizes the role of competition in making contracting a superior alternative to local bureaucratic production: (1) service-cost criterion which refers to competition and economies of scale will force bidders to lower costs; and (2) service-performance criterion which refers to competition will compel vendors to follow performance standards and keep the quality as required.

As prior literature indicates, "the potential for more efficient service delivery typically is a driving force in the decision to outsourcing" (Brudney et al. 2005, 393; Savas 2000). Government managers encourage competition for their contracts as an effective way to improving efficiency (Brown and Potoski 2003b, 2005; Warner and Hefetz 2012). In a complete competition, governments could make comparisons among private bidders and choose contractors with the lowest production cost and the best quality. Noncompetitive markets provide insufficient information for contracting organizations with bounded rationality to find best vendors, hence increase the occurrence of opportunism and the risk of contracting failure.

Effective and competitive “markets provide managers with important information about prices and service quality across vendors and facilitate disciplining vendors who fail to meet contract standards” (Brown, Potoski, and Van Slyke 2006, 323; Hart and Moore 1999; Niskanen 1971). However, “strong and effective markets require some fairly strict conditions: (1) they need large numbers of buyers and sellers; (2) participants need to be well informed about products and each other’s preferences; and (3) actors must be able to enter and exit the market and exchange resources at low costs” (Brown, Potoski, and Van Slyke 2006, 323). Thus, a question public officials need to ask before the make-or-buy decision is whether there is enough competition (Amirkhanyan 2007; Cohen 2001; Sclar 2000).

Public health service market competition can impact the make-or-buy decision in local health departments as well. I argue that the quantity of competitive vendors influences the decision of internal or external provision. With more potential vendors, public health agencies may choose to produce externally because they have advantages in bargaining with sufficient information and candidates for contracting. Typically, the markets for service delivery are shaped by alternative providers in nonprofit and for-profit organizations that are able to supply services. I further argue that governments have preference for nonprofits as contractors in the make-or-buy decision.

Contract² failure theory can help to explain why nonprofit health care services organizations are preferred vendors in the market competition. Public health services are inherently complex. “Producers of health services have more accurate knowledge of the quantity, quality, and cost of services delivered than do consumers”, which is called “information asymmetry” (Young 2012, 154). As a result, contract failure occurs because “customers feel unable to judge competently the quality or quantity of services they are receiving” (Hansmann 1987; Young 2012, 154). “When consumers are well informed relative to suppliers, the private sector is usually the institution of choice. But when consumers are underinformed relative to suppliers, the private sector often performs badly” (Weisbrod 1991, 6). Under such circumstances, the utilization of nonprofit health care services as alternative producers is a remedy to contract failure. There are three basic rationales for the preferred role of nonprofit organizations to overcome the contract failure and perform better than for-profits.

First, nonprofits are more trustworthy than for-profits to deliver public health services because the tax-exempt status requires nonprofits to distribute its financial surplus only for public benefit. Hansmann (1980, 838) asserts that “a nonprofit organization is, in essence, an organization that is barred from distributing its net earnings, if any, to individuals who exercise control over it, such as members, officers, directors, or trustees”. In contrast, private firms report to founders, owners, employees, shareholders, etc. They are more likely to exploit their

² The term “contract” here is a general concept in economics, not the agreement between governments and vendors in outsourcing. Contract failure theory “is a particular aspect of the more general economic theory of market failure” (Young 2012, 154).

customers to maximize profits for personal benefit. Keane, Marx, and Ricci (2002, 1252) interviewed 347 LHD directors, some “believed that for-profit organizations lack a commitment to public health” because they “have to be very concerned with their stakeholders,” and that “profit could be placed ahead of the goals of public health.” They stated that “people who need public health services don’t get them with for-profit organizations”(1252). Both public health agencies and health service “consumers may fear the possibility of exploitation” by for-profits, thus will turn to services from nonprofits (Young 2012, 155).

Second, Hansmann (1980) and Young (1983) contend that leaders in nonprofits are motivated by public service-oriented purposes, therefore manage service programs in pursuit of public ideals rather than self-interest income and profits for shareholders. The virtue of nonprofit leaders not only attracts the kinds of people with similar missions to engage in the nonprofit sector but also provides “consumers and supporters with confidence they require to overcome contract failure” (Young 2012, 155). Thus, it is understandable that LHDs would choose nonprofits for outsourcing as they share similar goals as undertaking responsibilities to protect and promote human well-being.

Third, from the economics perspective, Easley and O'Hara (1983) argue that “nonprofits are socially optimal mechanisms for the provision of goods services (when) the benefits of which are difficult to observe or measure” (531). “State statutes stipulate that a nonprofit’s operating costs, including compensation, must be reasonable” (532). Hence, nonprofits accept only reasonable compensation to cover operating costs while “promise to devote all other

resources to the costs of producing services” (Young 2012, 155). In contrast, the expenditures and benefits in for-profits cannot be specified, monitored and policed for implicitly measured services. Hence, “nonprofits may be superior to for-profits if the output cannot be costless observed” (Easley and O'Hara 1983, 538). Therefore, I hypothesize that:

H7: LHDs are more likely to contract out public health services with more nonprofits within the jurisdiction.

2.4 Management

Empirical evidence indicates that outsourcing does not always result in expected lower costs or better-quality service. To reduce risks of failure, contracting management requires managerial knowledge and strategic skills for public managers (Brown 2013; Brown, Potoski, and Van Slyke 2018). Morgan, Hirlinger, and England (1988) find that professional administrators with relevant expertise can make contracting out work well. Brudney et al. (2005, 393) argue that “contracting out reshapes the way in which public programs are managed” and requires new managerial techniques for public managers, therefore agency heads “in their position for a shorter period of time will be more likely to adopt a change or reform in service delivery than administrators with longer tenure”. That is to say, younger agency heads are more sensitive to innovation, new ideas and solutions. Older managers with longer tenure may intend to maintain existing organizational routines and practices (Damanpour and Schneider 2006; Huber et al. 1993; Mumford 2000). In addition, “agency heads with higher education may be

more knowledgeable about privatization and better prepared to manage a privatization initiative successfully” (Brudney et al. 2005, 393). Previous studies suggest that educated administrators are more likely to use complex solutions to problems, facilitate the adoption of change, and reduce uncertainty (Bantel and Jackson 1989; Damanpour and Schneider 2009; Huber et al. 1993; Lee, Wong, and Chong 2005). Thus, I hypothesize that:

H8: LHDs are more likely to contract out public health services if LHD director is younger.

H9: LHDs are more likely to contract out public health services if LHD director has a higher education degree.

2.5 Data and Methodology

2.5.1 Data

The data used in this study come from different sources. The outsourcing data were drawn from the 2016 National Profile of Local Health Department Study that was conducted by the National Association of County and City Health Officials (NACCHO). For the 2016 Profile study, a total of 2,533 LHDs were included in the study population. The NACCHO launched the final questionnaire from January through April 2016 via an email including a link to a web-based questionnaire sent to a designated primary contact of every LHD in the study population. Overall, the 2016 Profile study had a response rate of 76% (National Association of County and City Health Officials 2017a). The NACCHO 2016 data describe how services/activities, funding, executives, staffing, and governance vary across the nation. The NACCHO studies are funded

by the Centers for Disease Control and Prevention (CDC) and the Robert Wood Johnson Foundation. Demographic characteristics were obtained from the 2011-2015 American Community Survey 5-Year Estimates by U.S. Census. Information of health care and social assistance organizations was achieved from the 2012 Economic Census.

2.5.2 Unit of Analysis

The unit of analysis for this study is a local health department (LHD). Not all LHDs are county-level government agencies. Approximately 69% of LHDs are county-based, 8% of LHDs serve multiple-counties, and 20% of LHDs serve cities or towns (in New England) (National Association of County and City Health Officials 2017a). The 2016 LHD jurisdiction classification consists of five types: city, multi-city, city-county, county, and multi-county. In order to better understand the make-or-buy decision in LHDs whether they serve towns with relatively small population or multi-counties with relatively large population, I include all five types of LHDs in our analysis while controlling jurisdiction in the models.

2.5.3 Variables and Measurement

The main purpose of this study is to test the hypotheses about the impact of determinants on the make-or-buy decision at the LHD level. The 2016 NACCHO data include ten categories of health services/activities and specific health services/activities under each category for LHDs. As shown in Appendix A, basically, there are three types of providers for each specific health service/activity: “performed by LHD directly”, “contracted out by LHD”, and

“provided by others in community independent of LHD funding”. “Contracting out” is defined as “pay another organization to perform this activity or service on behalf of your LHD” (National Association of County and City Health Officials 2017a). “Provided by others in community independent of LHD funding” means that “other organizations provide these services and do not receive funding from LHDs” (National Association of County and City Health Officials 2017a). Health services may be performed by one type, two types, or all three types of providers. That is, these providers are not mutually exclusive in providing health services for local residents. As noted earlier, nonetheless, this study focuses only on production by LHD or publicly funded vendors, thus excludes production by “others in community independent of LHD funding” in the analysis.

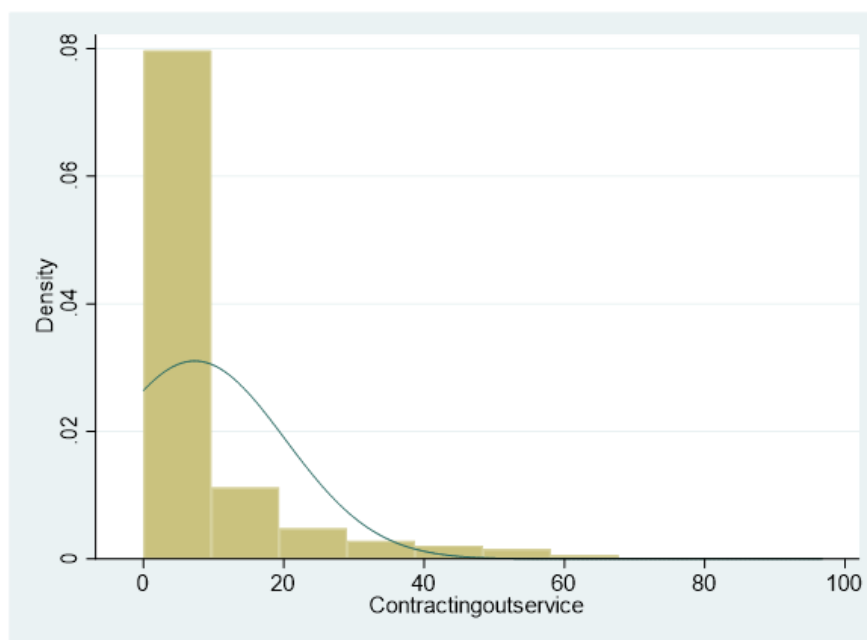


Figure 4. Distribution of contracting out public health services

The dependent variables are measured by “%Buy/(Make+Buy)” or the percentage of services funded by LHD (in-house delivery or contracting) that are contracted out. The zero results (make>0, buy=0) indicate the services are completely in-house delivered. The positive results (make>0, buy>0) mean that LHDs contract out certain services. The results that are meaningless (make=buy=0) automatically exclude those LHDs who did not provide services at all in analysis. The measurement is exhibited as below:

$$\% \frac{Buy}{Make + Buy} = \frac{Services\ Contracted\ Out\ by\ LHD}{Services\ Performed\ or\ Contracted\ Out\ by\ LHD} \times 100\%$$

As for independent variables, *Association* refers to whether or not an LHD has been accredited by the Public Health Accreditation Board Program (H1). It is created as a dummy variable. *Budget* refers to if an “LHD’s current fiscal year budget is less than previous year’s budget” (National Association of County and City Health Officials 2017a) (H2). It is coded as “-1=less budget, 0=same budget, 1=more budget”. *Workforce* represents the number of current LHD employees per 100 residents within the jurisdiction (H3). Percentages of nonwhite (*minority*), people older than 65 (*older people*), and population below poverty level in the past 12 months (*low-income people*) are measured to examine H4-6. The total numbers of nonprofit and for-profit health care and social assistance organizations were drawn from the 2012 Economic Census. The ratios of nonprofits and for-profits to population times 100, or the number of nonprofits/for-profits per 100 residents, within jurisdiction are used as indicators *nonprofits* and

for-profits (H7). Director age and education degree are coded to test H8-9. The models also control *jurisdiction* where LHDs are located, which is coded as 0=city; 1=multi-city; 2=city-county; 3=county; 4=multi-county. The variables, operational definitions, measures, and data sources are displayed in table I.

2.5.4 Methodology

As one can see from figure 4, percentages of contracting health services are continuous variables that display highly left-skewed and zero-inflated distribution. That is to say, only a small fraction of LHDs contract out health services. “Although one could potentially use OLS to model these variables, there are better alternatives” (Deb and Norton 2018, 494). For example, the tobit model can estimate linear relationship between variables with left- or right-censoring and continuous outcome variables (University of California Los Angeles 2019). However, the tobit model assumes an underlying normal distribution that is truncated by the threshold or censor. If I use the tobit model for the dependent variable with zero as the left censor, then it assumes true values might fall below the censor of zero. When zeros represent true values instead of censored values, as shown in this study, the underlying normal assumption becomes dubious (Min and Agresti 2002).

To deal with the cases in which distributions exhibit substantial skewness as well as mass at zero, economists and statisticians have “settled on the two-part model as the best way

TABLE I. VARIABLES, DEFINITIONS, MEASUREMENT, AND SOURCES

Variables	Operational Definitions and Measurement	Data Sources
<i>Contracting out</i>	Percentage of public health services funded by LHDs that are contracted out	2016 NACCHO
<i>Association</i>	LHD has been accredited by the Public Health Accreditation Board (PHAB). It is coded as a dummy variable (1=yes; 0=no)	2016 NACCHO
<i>Budget</i>	LHD's current fiscal year budget is compared to previous year's budget. It is coded as a category variable (-1=less budget; 0=same budget; 1=more budget)	2016 NACCHO
<i>Workforce</i>	The number of current LHD employees per 100 residents within the jurisdiction	2016 NACCHO
<i>Minority</i>	Percentage of nonwhite in population within jurisdiction	2011-15 ACS 5-Year Estimates
<i>Older people</i>	Percentage of people older than 65 in total population	2011-15 ACS 5-Year Estimates
<i>Low-income people</i>	Percentage of population below poverty level in the past 12 months	2011-15 ACS 5-Year Estimates
<i>Nonprofits</i>	The total number of nonprofit health care and social assistance organizations per 100 residents within jurisdiction	2012 Economic Census
<i>For-profits</i>	The total number of for-profit health care and social assistance organizations per 100 residents within jurisdiction	2012 Economic Census
<i>Director age</i>	The age of the person in the top executive position in an LHD	2016 NACCHO
<i>Director degree</i>	The education degree of the top executive in an LHD. It is coded as a category variable (0=Associate degree; 1=Bachelor's Degree; 2=Master's Degree; 3=PhD Degree)	2016 NACCHO
<i>Jurisdiction</i>	LHD jurisdiction classification (city/multi-city/city-county/county/multi-county). It is coded as a category variable (0=city; 1=multi-city; 2=city-county; 3=county; 4=multi-county)	2016 NACCHO

TABLE II. DESCRIPTIVE STATISTICS OF DEPENDENT, INDEPENDENT, AND CONTROL
VARIABLES

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>Dependent Variables</i>					
Contracting out	1851	7.308	12.848	0	96.774
<i>Independent Variables</i>					
Association	1761	0.052	0.223	0	1
Budget	1618	1.064	0.718	0	2
Workforce	1766	0.077	0.110	0.001	2.189
Minority	1860	21.289	18.545	0.603	97.660
African American	1860	7.616	12.542	0	87.857
Hispanic American	1860	8.354	11.242	0	95.183
Asian American	1860	2.068	3.506	0	55.628
Native American	1860	1.689	5.130	0	76.415
Older people	1866	17.497	4.410	4.769	47.657
Low-income people	1866	15.005	6.465	1.600	48.997
Nonprofits	1856	0.063	0.043	0	0.428
For-profits	1853	0.181	0.087	0	0.803
Director age	1699	52.418	9.628	25	80
Director degree	1746	1.723	0.830	0	3
<i>Control Variables</i>					
Jurisdiction	1866	2.620	1.141	0	4

to model observations with mass at zero and many positive values” (Deb and Norton 2018, 495; Min and Agresti 2002, 17). Duan et al. (1983, 118) proposed the two-part model by separating behavior into two stages, first a decision to have positive values, and then a decision about the level of values, conditional on its being positive. More specifically, the model has two equations. The first is a logit or probit equation for the dichotomous event of zero or positive values. The second equation is a linear (OLS) or a generalized linear model (GLM) for positive outcomes. In terms of this study, I apply the two-part model with robust standard errors adjusted for clustering in state to dependent variables with mass at zero and positive values. In the analysis, each model consists of two parts or two equations. The first part probit regression estimates what indicators predict the likelihood of contracting out public health services (dependent variables are 0/1). The second part OLS regression further estimates what factors influence the extent of contracting in LHDs (dependent variables are positive values).

2.6 Description of Variables

Table II exhibits descriptive statistics of dependent, independent, and control variables. As one can see, the sample includes 1866 local health departments. As for dependent variables, the extent to which LHDs would make or buy health services varies across the nation. The average percentage of outsourcing public health services relative to LHD-funded services is 7.31%. Only 739 LHDs have chosen outsourcing rather than in-house delivery of public health services.

With regard to independent variables, there are only 92 agencies that have been accredited by the PHAB program. Among all, 22% of LHDs received less budget in current fiscal year than previous year's budget, while 46% received approximately the same budget and 28% received even more budget. LHD workforce varies from 0.001 to 2.19 per 100 citizens across the nation. On average the percentages of nonwhite, people older than 65, and population below the poverty line are 21.29%, 17.50%, and 15.01% separately. The average ratio of nonprofit health care and social assistance organizations to population (0.06 per 100 citizens) is smaller than the ratio of for-profits (0.18 per 100 citizens) within the jurisdiction. The age of LHD Directors varies from 25 to 80 and is 52 years old averagely. In the final dataset for analysis, there are 269 city/town LHDs, 29 multi-city LHDs, 3 city-county LHDs, 1406 county LHDs, as well as 159 multi-county LHDs.

2.7 Two-Part Model Analysis

The two-part model analysis results with standardized coefficients presented in table III help shed some light on understanding not only the make/buy decision but also the extent to which LHDs contract out public health services. Both parts cluster on state. Starting from part 1, the Probit regression analysis provides explanation for the reasons why some LHDs choose outsourcing rather than in-house delivery. The first part results suggest that an LHD is more likely to choose "buy" rather than "make" if the agency has been accredited by the PHAB program, there is larger ratio of workforce relative to population, the director is younger or has a

TABLE III. TWO-PART MODEL REGRESSION ANALYSIS (STANDARDIZED COEFFICIENTS)

Variables	Model 1 Outsourcing	Model 2 Outsourcing
<i>Part1: Probit</i>		
Association	0.125**(0.181)	0.123**(0.180)
Budget	0.035(0.050)	0.034(0.050)
Workforce	0.199*(0.818)	0.201*(0.841)
Minority	0.064(0.005)	
Hispanic American		0.035(0.007)
African American		0.009(0.007)
Asian American		0.062(0.016)
Native American		0.034(0.009)
Older people	0.026(0.011)	0.031(0.011)
Low-income people	-0.068(0.013)	-0.049(0.012)
Nonprofits	-0.011(1.366)	-0.014(1.323)
For-profits	0.048(0.678)	0.039(0.638)
Director age	-0.064**(0.003)	-0.063**(0.003)
Director degree	0.112*(0.058)	0.114*(0.060)
Jurisdiction	-0.142*** (0.036)	-0.147*** (0.036)
_cons	.(0.259)	.(0.241)
N	1339	1339
Log pseudo likelihood	-884.1691	-883.0440
Wald Chi-square (df)	73.75(11)	82.25(14)
Pseudo R ²	0.0399	0.0411
Clusters	47	47
<i>Part2: Regress</i>		
Association	-0.048(1.708)	-0.050(1.736)
Budget	-0.009(0.870)	-0.009(0.867)
Workforce	0.123(10.500)	0.120(10.980)
Minority	0.162**(0.049)	
Hispanic American		0.104*(0.058)
African American		0.047(0.057)
Asian American		0.098*** (0.080)
Native American		0.032(0.132)
Older people	0.123*(0.182)	0.129*(0.185)
Low-income people	-0.150*** (0.097)	-0.116*(0.112)
Nonprofits	0.193*(25.340)	0.192*(25.810)
For-profits	-0.135*** (5.254)	-0.149*** (5.120)
Director age	-0.021(0.053)	-0.017 (0.053)
Director degree	-0.006(0.777)	-0.001(0.807)
Jurisdiction	-0.188*** (0.477)	-0.185*** (0.474)
_cons	-9.296e-09*(6.872)	-9.549e-09(7.231)
N	739	739
Log likelihood	-2493.7421	-2941.6239
F value	10.32(11,45)	16.76(14,45)
Adj R ²	0.1326	0.1340
Clusters	46	46

Robust standard errors in parentheses: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

higher education degree. Besides, city/town LHDs are more likely to “buy” rather than “make” public health services than are county or multi-county LHDs.

Part 2 OLS regression analysis with robust standard errors estimates the determinants of various extent of outsourcing. The results indicate that an LHD is likely to contract out more relative to LHD-funded services with larger ratio of nonprofits, smaller ratio of for-profits, lower percentage of poverty population, as well as higher percentage of minority and older people. In addition, LHDs within smaller jurisdictions or cities/towns are likely to buy more public health services than do county or multi-county LHDs.

As far as one can see from table III, the analysis in model 1&2 demonstrates how the factors impact on the outsourcing decision in LHDs. First, the national accreditation program seems to encourage the “buy” strategy for LHDs. The findings in the Probit analysis suggest that an LHD which has been accredited by the PHAB is more likely to have at least one type of health service contracted out compared to those LHDs that have not yet joined the national accreditation program. This is consistent with hypothesis 1. The findings in the OLS regression analysis, however, do not show correlation between being a member and contracting more rather than less public health services.

Second, in terms of the role of fiscal pressure in the make-or-buy choice, the results do not show correlation between budget and the decision to outsourcing, which does not support H2. The results do exhibit that the ratio of workforce is weakly correlated to outsourcing health

services, which supports H3. As workforce is measured by the number of LHD employees per 100 residents, LHDs with larger ratio of workforce serve smaller population. Thus, the results suggest that LHDs within smaller jurisdictions are more likely to seek the alternative of outsourcing. In addition, the control variable jurisdiction has a strongly negative relationship with the outsourcing option, which may indicate that city/town LHDs is more likely than county or multi-county LHDs to buy rather than make local public health services. LHDs that serve smaller jurisdictions and population may lack necessary fiscal resources to gain sufficient expertise, instruments, facilities, etc. As a consequence, they seek the complementary delivery through outsourcing to achieve scale economy.

Third, political pressure has no impact on the alternative of buying rather than making, but has strong impact on an LHD's decision to buying more rather than less. More clearly, LHDs serving population with larger percentage of low-income people are likely to contract out less public health services, while LHDs with more minority population and people older than 65 are likely to contract out less. The findings with regard to older and low-income people are consistent with hypothesis 5&6. To figure out why the results with respect to the minority population are in contrast to the hypothesis 4, model 2 in table III involves four racial groups. As the findings display, LHDs with more Asian and Hispanic Americans within the jurisdictions would go for more outsourcing. Given that Asian Americans have the highest individual average income among all races and Hispanic Americans earn higher average individual income than do African and Native Americans (American Community Survey 2015), the varied pressures on the

make-more-or-less choice from different minority groups may reflect their distinct consideration based on their income and socioeconomic status.

Fourth, the competition caused by the density of nonprofits and for-profits does not influence the make-or-buy decision, but significantly motivates LHDs on the extent to which services are delivered out of house. The findings signify LHDs' strong preference for nonprofits rather than for-profits as potential contractors to deliver public health services, which buttresses H7. LHDs identify nonprofits as more suitable alternatives because they believe nonprofits do not pursue profits and share similar commitment with public health agencies.

Last, but not least, as shown in the analysis results, younger and highly educated directors are more likely to choose the option of outsourcing. Yet, there is no relationship between these factors and buying more rather than less.

2.8 Discussion and Limitation

The purpose of this study is to elucidate the environmental, nonprofits, and management determinants of outsourcing in public health agencies. The findings provide new insights into this broad inquiry. First, this study examines the factors that may impact two-stage decision making: outsourcing at least one service or no outsourcing, and outsourcing more or less through the two-factor models. The findings demonstrate different mechanisms in the two-step outsourcing decisions: (1) the very first step toward the outsourcing world is influenced by the age and education of directors, the ratio of workforce to population, and the recommended

outsourcing strategy by the Public Health Accreditation Board; and (2) the following step to more or less outsourcing is affected by the characteristics of population in local communities as well as the density of nonprofits within the jurisdiction. In other words, it appears that the attempt on buying health services is motivated by the director's own judgment based on education and knowledge, willingness to accept the innovation, consideration of the insufficient workforce, and learning from practices in peer agencies that have been accredited. Moreover, once the director has decided to implement contracting policy in service delivery, s/he would think more about the recipients and potential contractors, that is, certain groups of people and nonprofit/for-profit organizations. Thus, this study, to a certain extent, points to the importance of understanding the contracting decision under two connected circumstances and contributes to growing literature concerning public service contracting.

Second, or more specifically, I observe that the following several factors influences the buy-or-not-buy decision: (1) The network and institutional linkage among the members accredited by the Public Health Accreditation Board play an influential role in the outsourcing decisions and activities. Put it another way, becoming a PHAB member can be the motivation for LHDs to pick the in-house delivery alternative. The findings indicate that the information shared among the PHAB members tilts toward using outsourcing in meeting health services needs since the PHAB emphasizes the application of outsourcing to daily practices in many health departments in the official brochure of standards and measures. It is not a requirement that LHDs must consider in order to join the accreditation program. It seems more likely the

recommended direction pointed out by those members that outsourcing can help LHDs to better serve the population. (2) The ratio of workforce to population negatively predicts the outsourcing, which may suggest that a smaller LHD (such as city/town LHDs) contracts out services simply because they lack workforce or capacity and are unable to satisfy service needs. Consequently, they seek help through outsourcing to meet health service needs. (3) This study also explores management factors, the role of age and education of LHDs directors, in the outsourcing decision making. Consistent with prior research, the findings convey convincing information that a young and highly educated director would take more efforts to employ and implement outsourcing from zero to at least one health service. The very first step from scratch may actually be extraordinarily courageous in view of the fact that the average extent of outsourcing in local health departments is still much lower than that in many other public agencies.

Third, the findings also convey the factors that may influence the buy-more-or-less decision: (1) This study substantiates the positive role of the existence and density of nonprofits in LHD provision decision making. More nonprofits within the area will encourage the LHD directors to contract out more services, which supports the hypothesis as to public agencies' preference for nonprofits rather than for-profits as potential partners in publicly funded production. It implies that local health departments and other public agencies believe the power of competition which can yield lower prices and better quality. Furthermore, the inherent features of public service-oriented mission and pursuit of no financial surplus make nonprofits

more trustworthy than for-profits. This implication is particularly relevant and critical to human and social services agencies like local health departments who choose nonprofits as contractors because they share similar commitment to human well-being and wellness. There could be interdependence relationship between public health agencies and health care nonprofits. Local health departments are facing expanding health service needs especially from the low-income and older population, as well as diminished capacity like insufficient workforce. Through outsourcing, LHDs provide funding from tax revenues to nonprofit contractors to obtain their expertise, professionals, facilities, etc. Nonprofit organizations for health and human services, on the other side, can survive relying on government funding and provide public health services in a flexible and innovative way. Therefore, the relationship built between the two actors through outsourcing can produce a win-win situation to benefit local residents. (2) I have observed the strong political pressure from low-income people on the buy-more-or-less decision in the results. Low-income people are more likely to accept lower-cost and lower-quality health services, thus may exert pressure on public health agency officials to keep as many in-house health services as possible and contract out less to external vendors. On account of the expensive private health service market in this nation, LHDs provide the health care safety net for those underrepresented groups, which is exactly the responsibility for a public agency. Meanwhile, however, seniors, high-income communities, and communities with high level of Asian Americans or Hispanic Americans would like to see more outsourcing in that they demand more specialized and higher-quality health services with multiple choices. From this perspective, this study has key implications for the design of contracting policy. LHD directors should tailor their

buy-more-or-less decision to specific health service needs based on the demographic characteristics and socioeconomic status of local residents.

Fourth and relatedly, this study has key implications for the design of outsourcing policy. It is surprising to observe that LHDs, as the supplier of public health services, do not prioritize the service needs from the demander or the public when they are making the outsourcing decision. Despite their consideration of political pressure on the buy-more-or-less decision, this is subsequent to the crucial decision toward buy rather than not buy. The fact that LHD directors are not elected officials does not denote that they shall not lay emphasis on the most likely groups of recipients of public health services: low-income people and some minority population. To provide public goods and services in an effective ways, public health managers need to be cognizant of a combination of determinants such as service demanders, agency capacity, peer agencies' practices, potential partners, local community stakeholders, etc. throughout the decision making process for both buy-or-not-buy and buy-more-or-less.

Several limitations of this study, however, warrant attention and future inquiry. First, the data limitation makes it hard to better measure budget. Although some studies have identified fiscal stress as a significant determinant of outsourcing (Brudney et al. 2005; Chandler and Feuille 1994; Dilger, Moffett, and Struyk 1997; Ferris 1986; Ferris and Graddy 1986; Greene 2002; Kodrzycki 1994; Van Slyke and Hammonds 2003; Warner and Hebdon 2001), Boyne (1988) points out that other studies demonstrate little evidence to support for the view that fiscal stress can spur the outsourcing alternative. The lack of support for this argument may arise from

two primary reasons: inappropriate measurement of fiscal pressure and misunderstanding of an LHD's purpose of outsourcing (Boyne 1988; Brudney et al. 2005). An ideal measure for it in this study should consider both budget and service needs. Therefore, it is not sure if there is correlation between budget with this ideal measurement and the make-or-buy decision.

Second, the cross-section data limit the examination of the temporal dynamics or a causal inference from the results. Even with these limitations, this study contributes to our understanding of the outsourcing decision making in local health departments across the nation.

3. ESSAY TWO: SERVICE CHARACTERISTICS FACTORS OF THE MAKE-OR-BUY DECISION IN LOCAL HEALTH DEPARTMENTS

3.1 Introduction

Many government contracting scholars have attempted to explain the factors of the make-or-buy decision in public agencies. This study puts an emphasis on what factors and mechanism drive local health departments to produce services in house or contract out service delivery. Chapter 1 shows a framework for the public service provision which incorporates institutional environment and service characteristics. Chapter 2 has reviewed theories related to institutional, fiscal, political pressures, nonprofits, and management, as well as analyzed agency level environmental factors of LHDs' outsourcing decision making. Chapter 3 intends to move on and explore how transaction cost approach interprets the mechanism of the public health delivery choice.

Two dimensions of transaction costs—asset specificity and service measurability—have been employed as public service characteristics and examined as factors of the make-or-buy decision in public agencies (Brown and Potoski 2003b, 2004, 2005; Brown, Potoski, and Van Slyke 2006, 2016, 2018; Carr, LeRoux, and Shrestha 2009). Prior research with respect to public service contracting either includes only several health services or views public health as a whole. No prior literature has yet to dig into all the services that LHDs could deliver and investigate the decision making with regard to multiple delivery modes.

In a larger picture, several prevailing economic theories including market failure and government failure theories have unfolded rationales on how the public, private, and nonprofit sectors complement for each other's inherent limitations in satisfying public needs for collective consumption goods or public goods (Douglas 1983; Hansmann 1980, 1987; Smith and Grønbjerg 2006; Steinberg 2006; Weisbrod 1975, 1991; Young 2012). Through these theoretical lenses, this study will throw light on the blind spot of public health service delivery and call attention to comprehending the mechanism of LHDs' decisions to optional production modes from service characteristics perspective.

Public health services consist of both collective and individual consumption goods, which results in a complex mechanism of mixed delivery by local health departments, external contractors, the private business, or the voluntary sector independent of government funding. This study aims to figure out the following research questions. What service characteristics may influence the make-or-buy or mixed production decision in LHDs? How do these service characteristics affect multiple health service delivery modes? To what extent will market and government failures influence the health service delivery modes?

This study examines these questions by using multiple data sources from National Profile of Local Health Department Study combined with data derived from a small set of public health experts in order to measure two characteristics for public health services. There are two primary findings in this essay. First, public health agencies are more likely to deliver internally at low and high levels of transaction costs, while are more likely to contract out to external vendors

at moderate levels of transaction costs. Second, LHDs' health service delivery choice is influenced by the density of nonprofits/for-profits and low-income people who demand the most public service recipients.

This manuscript proceeds as follows. I first delineate transaction cost approach in an effort to establish an enhanced understanding of the health service delivery modes. Then, I review the foundational economic theories shaping a clearer comprehension of how the public, private, and nonprofit sectors cope with the demand and supply of public health services in local communities. Next, I detail the data collection and present the findings of multinomial logit regression analysis. Finally, I conclude with a discussion of the theoretical and empirical implications of the results, as well as the study's limitations to inform future studies.

3.2 Transaction Cost Approach

The concept of transaction cost was initially introduced by Coase (1937) in *The Nature of the Firm*. Coase (1937) observed that governments treat transactions on a market differently from the same transactions organized within a firm and only tax the former ones. He (1937) recognizes the inconspicuous costs of organizing transactions besides obvious production costs through the price mechanism. Moreover, he points out that "as the transactions which are organized increase, the firm may fail to make the best use of the factors of production" (Coase, 1937, 394-395). Furthermore, he suggests a firm stop expansion when the costs of organizing an extra internal transaction become "equal to the costs of carrying out the same transaction on

the external market” (395). In other words, both production and transaction costs are equally important to a firm.

Based on Coase's (1937) arguments, Williamson has moved forward and made more contribution by establishing the transaction cost approach for the study of organization (Williamson 1971, 1975, 1981, 2008; Williamson, Winter, and Coase 1991). Williamson (1981) defines that “a transaction occurs when a good or service is transferred across a technologically separable interface” (552). Furthermore, “transaction cost analysis supplants the usual preoccupation with technology and steady-state production expenses with an examination of the comparative costs of planning, adapting, and monitoring task completion under alternative governance structure” (552-553).

Brown and Potoski (2003b) suggest that “transaction costs are essentially the management costs associated with either internally producing the service or buying it through contracting” (443). Williamson (1981) proposes two behavioral assumptions from human nature for understanding the transaction cost approach: bounded rationality and opportunism. “With bounded rationality, it is impossible to deal with complexity in all contractually relevant respects” since agents/human actors experience limits in solving complex problems, thus “incomplete contracting is the best that can be achieved” (Simon 1957, 1978; Williamson 1981, 548; 1999, 2008). As circumstances change, opportunism may occur to seek self-interest, which is a primary hazard threatening the reliable conduct of transactions (McKinley and Mone 2003; Williamson 1981, 2008). In Williamson's a series of articles and books, transaction costs can be

understood through three critical dimensions: uncertainty, recurrence³, and asset specificity (Williamson 1979, 1981, 1985, 1996, 2008). He argues that when the degree of unpredictability of transaction outcome (uncertainty) is high, the frequency with which transactions recur (recurrence) is high, and the fixed investment that are specialized to a particular transaction (asset specificity) is large, transaction costs rise accordingly. Furthermore, there are three generic forms of governance—market, hybrid, and hierarchy—which could be responsible for the differential costs and competencies in transactions (Williamson 1975; 1991; 2008). Markets and hierarchies are polar modes that emphasize the power of autonomous economic actors and formal organizations respectively (Williamson 1991). The hybrid contracting mode is an intermediate mode, located between market and hierarchy (Williamson 2008). The governance mode changes correspondently when transaction costs increase or decrease (Williamson 1985; 1991; 2008).

“Transaction cost analysis is an interdisciplinary approach to the study of all forms of organizations” (Williamson 1981, 548). Transaction cost approach has had numerous applications to “the study of agriculture, public health, public bureaus, and economic development and reform” (Williamson 2010, 673). Williamson (1999) examines public bureaucracy through the lens of transaction cost approach and avers that “(1) special

³ Williamson (1981, 555) puts a focus on uncertainty and asset specificity, especially the latter, because he includes only recurrent transactions for the purpose of his study. “For a discussion of the organizational consequences of occasional, rather than recurrent, contracting, please see Williamson (1979)” (Williamson 1981, 555). Dixit (1998) examines policy making through the lens of transaction cost approach. He views credible contracting as a recurrent theme as well (Williamson 1999, 310).

circumstances aside, government should rarely produce its own needs, (2) competition can be harnessed to provide a safeguard for mundane procurement, but (3) specialized procurement is often beset by asset specificity and is more apt to be politicized” (Williamson 1999, 319). In the public administration scenario, governments often need to choose the means through which public services are to be produced and delivered: in-house or “make”, outsourcing/contracting out or “buy⁴”, or no provision funded by governments. Numerous research has explored transaction cost factors that may influence public officials’ decision to make or buy public services.

3.2.1 Asset Specificity

“Asset specificity refers to whether investments are specialized to a particular transaction” (Williamson 1981, 555). Put it another way, “asset specificity has reference to the degree to which an asset can be redeployed to alternative uses and by alternative users without sacrifice of productive value” (Williamson 1991, 282). In the transaction cost approach, much of the explanatory power turns on asset specificity, which gives rise to bilateral dependency, brings possible disturbances, and poses added contracting hazards (Williamson 1991; 2008). Asset specificity can become an issue at the outset “between the buyer and initial winning bidder,

⁴ The make-or-buy decision in Williamson’s (1981) transaction cost approach is different from the concept usually used in public administration scholarship. According to Williamson (1981), “make” refers to interfirm transactions under the “hierarchy” mode of governance, while “buy” refers to intrafirm transactions between autonomous actors on the market. The hybrid contracting mode is located between “make” and “buy”. However, in public administration literature, “make” represents in-house delivery of public services and goods, “buy” represents government outsourcing.

during contract implementation and at the contract renewal interval” (Williamson 1985; 2008, 5).

“Asset specificity can arise in any of three ways: site specificity, physical asset specificity, and human asset specificity” (Williamson 1981, 555). Assets that are unspecialized among users, or low asset specificity, “pose few hazards, since buyers in these circumstances can easily turn to alternative sources and suppliers can sell output intended for one buyer to other buyers without difficulty” (Williamson 1981, 555). With large specific capital or high asset specificity, nevertheless, the supplier is effectively “locked into” the transaction to a significant degree. As a consequence, “the buyer cannot turn to alternative sources of supply and obtain the item on favorable terms, since the cost of supply from unspecialized capital is presumably great. The buyer is thus committed to the transaction as well” (Williamson 1981, 555).

The governance mode changes correspondently when transaction costs increase or decrease (Williamson 1985; 1991; 2008). This logic “assigns simple generic transactions to the market mode, more complex transactions to the hybrid mode and very complex transactions are taken out of the market and organized within hierarchy” (Williamson 2008, 9-10). Williamson (2008) argues that hierarchy (“make”) “comes in as higher degrees of asset specificity and added uncertainty pose greater needs for cooperative adaptation” (9).

Consistent with this rationale, Brown and Potoski (2003b, 444) hold that “as the asset specificity of services increases, governments rely more on internal service production” (“make”). In addition, they raise a complement to the basic asset specificity hypothesis (444): “at very high levels of asset specificity, governments reduce internal service production” because

they cannot afford huge fixed investments and operating costs. They use 1997 ICMA data for multinomial logit analysis which include 1586 municipal and county governments, as well as 64 services. They examine “five service production mechanisms—internal production, joint contracting, complete contracts with other governments, complete contracts with private firms, and complete contracts with nonprofits” (Brown and Potoski 2003b, 456). Their findings, however, do not support basic hypothesis of the positive correlation between asset specificity and transaction costs as asset specificity increases from low to medium (456). They find that governments decrease internal production and joint contracting for highly asset-specific services (456).

Carr, LeRoux, and Shrestha (2009) explore three service production alternatives regarding 43 services in 109 city governments in Michigan: “internal production, joint or complete contracting with another government, production by a private or nonprofit organization” (403). Their findings with respect to asset specificity, however, conflict with Brown and Potoski’s (2003b) findings. The results show that governments are more likely to rely on external production as asset specificity increases, and less likely to seek external production by nongovernmental suppliers at high levels of asset specificity (419).

This study is concerned with public health services in local governments. Prior studies have examined different kinds of public services in local governments, which include only several functions of public health or view public health service as a whole. Actually, a local health department may deliver as many as 85 types of population and clinical public health

services every day. As Brown and Potoski (2005) and Hefetz and Warner (2011) indicate, on average public health programs have high asset specificity. Since public health services have almost the highest asset specificity among all the public services, the rationale of asset specificity may still work in terms of the make-or-buy decision in public health service production but show some different findings.

3.2.2 Service Measurability

Alchian and Demsetz (1972) explores “metering the output” in economic organizations which can facilitate the payment of rewards in accord with productivity. Measuring the output matters because productivity will be greater with rewards and productivity closely correlated. On the contrary, productivity will be smaller if the organization meters the output loosely, poorly or even negatively correlated with rewards (778-779). Williamson (1981) also emphasizes metering the output in illustrating how to cope with uncertainty. He (1981) indicates that “the internal organizational counterpart for uncertainty is the ease with which the productivity of human assets can be evaluated” (564).

Brown and Potoski (2003b) extend the concept of metering the output of human assets to general service measurability which refers to “how difficult it is for the contracting organization to measure the outcomes of the service, to monitor the activities required to deliver the service, or both of these” (444). Ease of measurement or service measurability “refers to how easily and well public managers can assess the quantity or quality of services” (Brown, Potoski, and Van

Slyke 2006, 323). Easy service measurability can help the contracting organization identify and assess performance, reduce disturbance and uncertainty, thus lower transaction costs. Service measurability or ease of measurement “has been identified as an important component of strategic decision-making defining the risks of privatization” (Brown and Potoski 2003b, 441; Cohen 2001; Romzek and Johnston 2002).

Brown and Potoski (2003b) maintain that “government produce more services through joint contracting (mixed delivery) as services become more difficult to measure; governments internally produce services that are extremely difficult to measure” (445). Their findings suggest that the level of internal service production does not change while governments shift production from complete contracting with private firms to joint contracts moving from easily to moderately measured services (459). “When services are very difficult to measure, governments increase internal production and reduce their reliance on all forms of external production” (459). Brown, Potoski, and Van Slyke (2006) argue that difficult-to-measure services may make vendors exploit their information advantage by lowering service quality and quantity. Therefore they (2006) suggest public managers produce such services internally and avoid the market. Carr, LeRoux, and Shrestha’s (2009) findings suggest that government are more likely to make reliance on production with or by other governments, and less likely to make use of nongovernmental providers as measurement difficulty increases (419). Moreover, “cities are less likely to use intergovernmental providers and more likely to turn to nongovernmental providers at very high levels of measurement difficulty” (419).

Even though measuring and monitoring performance is critical for contracts, “it must be technically possible to measure outputs, both quantitatively and qualitatively, and at a reasonable cost” (Ferris and Graddy 1991, 544). Service measurability is easier for services with tangible outputs such as garbage collection or road repair, but is more difficult for intangible outputs such as mental health or childcare (Ferri and Graddy, 1991). As Sclar (2000, 56) notes, “the reality of public work is that much of it is complex to perform, administer and evaluate. It is hard to call for privatization for more complex and less easily evaluated services such as health and human services”. In terms of public health services, the average service measurability may be higher than other public services due to the highly complexity.

Romzek and Johnston (2002) maintain that outcome or performance measures in the field of health care may be problematic in such circumstances as (1) public health agencies or vendors have insufficient capacity to collect the measurement data; (2) they have weak incentives to measure outcome; (3) data quality is not good; (4) stakeholders disagree about measurement standards; (5) vendors cannot control the outcomes; or (6) the time lag between contracting activities and outcomes influences the measurement (438-439). Furthermore, the correlation between measurability and delivery modes for public health services may be different from the correlation for other public services. Take snow plowing as an instance, the service measurability is relatively easy. The government that contracts out this service can simply check whether or not the street is cleaned up. In addition, the measurement cost is low because the government does not need to purchase a specialized machine or hire an expert to

do this. In another example, if a local health department contracts out screening and treatment for HIV/AIDS to an organization, it may be hard for the agency to measure and monitor the outcomes, which may require specialized instruments, facilities, and medical professionals. Therefore, I argue that it is more difficult to measure public health service delivery than to measure other public services.

In addition, measurability may align with asset specificity with regard to public health services because measuring outcome or performance also requires specialized assets. In other words, as asset specificity (building, facility, equipment, professional, etc.) increases, measurability may increase correspondingly. Despite asset specificity and service measurability being distinct terms and different transaction cost characteristics, they may influence the make-or-buy decision in public health agencies in similar ways.

As prior research suggests that the relationship between transaction cost and the production decision is not linear, this study will take into account the role of low, medium, and high transaction cost in health service provision market and focus on the changes of delivery modes corresponding to variation of transaction cost. Specifically, asset specificity (low, moderate, high) and service measurability (easy, moderate, difficulty) will be measured and discussed based on theoretical explanations of market failure and government failure. Moreover, the examination will cover not only publicly funded provision but also other providers independent of government funding.

3.3 Market Failure Theory

“Market failure theory refers to a situation in which the allocation of goods and services by a free market is not efficient” (Steinberg 2006, 277; Wolf Jr. 1979). Market failure is a theoretical explanation for the role of service characteristics in LHDs’ decision making, especially in the situations from low to moderate asset specificity and service measurability.

The United States does not have a universal or national health care system. Instead, the government is only one of the primary actors in the complex health service provision establishment. For-profit business and nonprofit health-related organizations produce many health and human services in the market. The prominence of the for-profit and nonprofit sectors “stems from a long-standing belief in the virtues of free market capitalism (and)... a preference for limited government that are deeply embedded in American culture” (LeRoux and Feeney 2014, 83). Americans believe in the greatest efficiency and effectiveness of market forces (84). Despite this essay focusing on government provision, the roles of other providers in the larger context of health service market in the U.S. can better depict how the competition environment influences the make-or-buy decisions in LHDs.

The service characteristic of low asset specificity enables for-profit or nonprofit health service providers independent of government funding to form provision capacity more easily because what they invest in can be simply utilized for alternative purposes. The large competitive market consisting of these providers can supply consumers with health services at

lower prices and higher quality. Since most consumers, also voters, are satisfied with the marginal value of the health services provided by a competitive and efficient market that is less than the tax price set by government otherwise, they would prefer less services funded by public agencies. As a result, LHDs are more likely to run little in-house production and outsourcing.

H1a: LHDs are less likely to produce public health services in house at low levels of asset specificity.

H1b: LHDs are less likely to contract out public health services at low levels of asset specificity.

As asset specificity moves from low to moderate levels, however, fewer providers especially for-profit business would have incentives to spend on building facilities, purchasing instruments, and hiring professionals for a specific health service that cannot be easily used for alternative offerings. Even if some private providers enter the market, they may charge higher prices than do those providers who produce services with low asset specificity. Particularly, the economic theory with regard to the “collective-consumption goods emphasizes that the private sector is an unsatisfactory production vehicle for public goods” in that it is likely to produce sub-optimal quantities unless finance the operation through user charges (Steiner 1969). This less competitive private market lacks the responsibility to provide public health services—collective goods—with very low prices, thus fail to benefit most or all members of local community. This is a market failure, or the problems of undersupply of services and negative consequences for the

consumer (LeRoux and Feeney 2014, 84). Furthermore, consumers' voters may thus find the marginal value of the service more than the imposed tax price" and would prefer the government to provide more public health services (Young 2012, 152). As a response to market failure, governments and nonprofits may overcome the inefficiency of private provision and fulfill the needs for public goods by providing more health services with moderate asset specificity than they do when services have low asset specificity. Moreover, LHDs may also increase contracting out as the transaction costs are not very high in managing vendors at moderate levels of asset specificity.

H1c: LHDs are more likely to produce public health services in house at moderate levels of asset specificity.

H1d: LHDs are more likely to contract out public health services at moderate levels of asset specificity.

As already indicated, service measurability may align with asset specificity. Put it another way, easy service measurability may be related to low asset specificity for many health services. Hence, at very easy levels of service measurability, there will be fewer public health agencies and many for-profit or nonprofit providers independent of LHD funding.

H2a: LHDs are less likely to produce public health services in house at easy levels of service measurability.

H2b: LHDs are less likely to contract out public health services at easy levels of service measurability.

When service measurability goes from easy to moderate levels, we will see similar changes to government-funded service provision. Yet, the rationale for the change may be a little different from that for asset specificity. When it is hard to weigh the outcome of a health service, consumers may find themselves falling in information asymmetry, which creates a market failure problem. “This occurs when a seller and a buyer have different types of information about the product”, or specifically, “when the seller of a good or service has more information than the buyer about the quality of the product” (LeRoux and Feeney 2014, 85). Such information imbalances between two parties who are engaged in a transaction “are problematic if the producer uses their information advantage to deceive consumers and exploit profits” (85).

Government can correct information asymmetry through intervention in the market. Consumers are more likely to place greater trust in publicly funded service provision such as governments, contractors, and nonprofits because they are mission-driven and lack a profit motive. They are more committed to delivering greater quality and quantity of services and increasing public values (AbouAssi et al. 2019; Brown and Slivinski 2006; Hansmann 1980, 1987; Smith and Grønbjerg 2006; Steinberg 2006). When consumers are unable to adequately judge the quality of health services and make adjustments based on their levels of satisfaction with the service (LeRoux and Feeney 2014, 86), LHDs and contractors may be ideal providers.

H2c: LHDs are more likely to produce public health services in house at moderate levels of service measurability.

H2d: LHDs are more likely to contract out public health services at moderate levels of service measurability.

Brown, Potoski, and Van Slyke (2015) further examine an alternative of service provision—mixed delivery or joint contracting, which they define as “combines elements of both direct and contract delivery” (242). “Under mixed delivery, the financing, production, and management can be split or shared between the government and a partner organization, such as a government, non-profit, or private firm” (242). They extend the make-or-buy decision to the “make, buy, or mixed service delivery” decision (243). They argue that as asset specificity increases, mixed service delivery (“make and buy”) is likely to be more attractive to governments than “make or buy” because (1) the government can capture the benefits of both public organization and market; (2) the costs of exiting the mixed delivery are lower than exiting complete contracting; and (3) the government can compare the internal and external costs of service delivery at the same time (Brown and Potoski 2003b; Brown, Potoski, and Slyke 2015). As a result, mixed service delivery may be a better choice than complete contracting for governments when transaction costs are not high.

H3a: LHDs are more likely to pursue mixed production of public health services as asset specificity increases from low to moderate levels.

H3b: LHDs are more likely to pursue mixed production of public health services as service measurability increases from low to moderate levels.

3.4 Government Failure Theory

Although government's intervention may fix the market failure problem, the government itself could also fail. In other words, "the existence of certain constraints on governments will be seen to create what might be termed government market failure, analogous to the conditions causing private market failure" (Weisbrod, 1975). The government failure theory can elucidate the changes in LHDs' decision making to health service provision when asset specificity and service measurability move from moderate to very high levels.

The government failure theory generally attempts to predict the circumstances under which goods and services will be provided governmentally, privately, as well as in voluntary market. The theory focuses on the limitations of government and the private sector and "how the nonprofit sector may fill in the niches left unserved by governmental action" (Hansmann 1987; Weisbrod 1975; Young 2012). Weisbrod (1975) argues that the constraint of the tax system "does not permit every consumer to equate the tax he pays with the marginal benefit of the good to him". Thus, the demands of the median voter will influence the tax system that "may be used by government to finance a particular expenditure program" (Weisbrod 1975, 171). The government failure theory suggests that each voter will "compare his marginal tax with the marginal benefit he receives from each collective-consumption goods" (171). If the majority

voters find the marginal value of some services less than the marginal tax, they may be unwilling to fully support, with their tax dollars, the level of government provision that only benefit narrow segments of population.

Based on the government failure theory, when asset specificity and service measurability move from moderate to very high levels or when the transaction costs are very high, public health agencies are more likely to reduce in-house service provision. Basically, all the local health services can be divided into two groups: population and clinical/patient-oriented health services. As Weisbrod (1975, 171) contends, “not all governmentally-provided goods and services have a significant collective-consumption component.” We may consider population health services as collective-consumption goods such as epidemiology, infectious disease control, environmental health surveillance, primary prevention, regulation and inspection, etc., while look clinical services as individual-consumption goods such as HIV/AIDS treatment, prenatal care, oral health, mental health and substance abuse services, etc. For the median voter, clinical health services are provided for certain groups of people, thus represent little marginal benefit for the majority who do not need these services. Furthermore, clinical health services with high transaction costs mean even less marginal value for a majority of consumers/voters. Hence, LHDs would most likely reduce or even withdraw from the provision market for clinical health services with high transaction costs. Moreover, although government is supposed to take the responsibility to supply population health services for the public, high asset specificity and difficult service measurability may bring obstacles for public agencies to

produce and deliver those services internally. It may be inefficient for LHDs to invest huge tax dollars into specific services for a small group of people. As a result, LHDs may decrease or even give up both in-house and outsourcing health services.

H1e: LHDs are less likely to produce public health services in house at high levels of asset specificity.

H1f: LHDs are less likely to contract out public health services at high levels of asset specificity.

H2e: LHDs are less likely to produce public health services in house at high levels of service measurability.

H2f: LHDs are less likely to contract out public health services at high levels of service measurability.

In terms of the mixed delivery, LHDs' choice may be different when transaction costs are very high compared with that with lower transaction costs. First, joint contracting means both governments and vendors make huge specialized investments which cannot be redeployed to alternative health service uses. Such a choice will reduce the benefits of scale economies and may be a waste of investment. Second, producing and monitoring services with high asset specificity and difficult service measurability simultaneously will generate high transaction costs. Thus, I argue that mixed delivery is less likely chosen by local health departments in such circumstances.

H3c: LHDs are less likely to pursue mixed production of public health services as asset specificity increases from moderate to high levels.

H3d: LHDs are less likely to pursue mixed production of public health services as service measurability increases from moderate to high levels.

3.5 Data and Methodology

3.5.1 Data

The data used in this study come from multiple sources. In order to capture public health provision choices, this study uses data from the 2016 National Profile of Local Health Department Study that was conducted by the National Association of County and City Health Officials (NACCHO). Demographic characteristics were obtained from the 2011-2015 American Community Survey 5-Year Estimates by U.S. Census. Information of health care and social assistance organizations was achieved from the 2012 Economic Census.

3.5.2 Unit of Analysis

The unit of analysis in this study is individual services that are produced and delivered to residents. Ten categories, 85 individual services are covered in the 2016 NACCHO survey. However, there are no questions regarding transaction costs. Measuring transaction costs are notoriously difficult (Williamson 1996; Brown and Potoski 2003b), but significant for explaining the make-or-buy decision. In spring 2019, I administered a questionnaire to a small group of public health experts (see Appendix B). These public health experts were purposely chosen on

TABLE IV. AVERAGE RATINGS OF ASSET SPECIFICITY AND SERVICE MEASURABILITY

Service	Asset Specificity	Service Measurability
<i>1. Immunization Services</i>		
Adult immunization	3.17	2.17
Childhood immunization	3.33	2.17
<i>2. Screening for Diseases/Conditions</i>		
HIV/AIDS	3.50	2.83
Other STDs	3.33	2.83
Tuberculosis	3.33	2.33
Cancer	4.00	3.00
Cardiovascular disease	3.33	2.50
Diabetes	2.83	2.33
High blood pressure	2.50	2.00
Blood lead	3.50	2.83
BMI (Body Mass Index)	2.00	1.67
<i>3. Treatment for Communicable Diseases Services</i>		
HIV/AIDS	4.50	3.17
Other STDs	4.00	2.83
Tuberculosis	4.33	3.17
<i>4. Maternal and Child Health Services</i>		
Family planning	3.33	2.67
Prenatal care	3.67	3.00
Obstetrical care	3.83	3.00
WIC (Women, Infants & Children)	3.17	2.67
MCH (Maternal and Child Health) home visits	3.50	2.83
EPSDT (Early and Periodic Screening, Diagnostic and Treatment)	3.50	3.17
Well child clinic	3.17	3.00
<i>5. Other Health Services</i>		
Comprehensive primary care	4.00	3.17
Home health care	4.17	3.50
Oral health	4.17	3.33
Behavior/mental health services	4.50	3.67
Substance abuse services	4.67	3.50
<i>6. Epidemiology and Surveillance Activities</i>		
Communicable/infectious disease	4.17	3.33
Chronic disease	3.50	3.50
Injury	3.33	3.00
Behavior risk factors	3.33	3.33
Environmental health	4.00	3.00
Syndromic surveillance	3.67	3.33
Maternal and child health	3.67	3.17
<i>7. Population-Based Primary Prevention Activities</i>		
Injury	2.83	3.50
Violence	3.33	4.00
Unintended pregnancy	3.17	3.83
Chronic disease	3.33	3.67
Nutrition	3.33	4.00
Physical activity	3.17	3.50
Tobacco	3.00	3.17
Substance abuse	3.83	4.00
Mental illness	4.17	4.33
<i>8. Regulation, Inspection and/or Licensing Activities</i>		
Tobacco retailers	3.17	2.83
Smoke-free ordinances	3.00	3.00

the basis of their ability to serve as key informants in determining the asset specificity and service measurability of a range of public health services. These public health experts were asked to rate a series of public health services on two transaction costs characteristics—asset specificity and service measurability. In order to increase participation of the public health experts, I cut down 41 services and kept 44 services in the survey. Six experts including two professors in public health or health policy survey at the University of Illinois at Chicago and four directors of local health departments in Illinois, served as the expert informants in this rating process. These ratings were then used in the analysis to measure asset specificity and service measurability of the health services studied in this chapter. Table IV shows the average ratings of asset specificity and service measurability for 44 services in eight categories. I incorporate 1863 local health departments and 44 public health services in the final data, which yields 81972 services for analysis. I use multinomial logistic regression model to estimate the provision choices. Hausman and Wald commands were employed to test independence of irrelevant alternatives and individual coefficients separately.

3.5.3 Dependent Variables

The survey question in 2016 NACCHO data includes 10 categories of health services/activities and specific health services/activities under each category for LHDs. As shown in Appendix A, basically, there are three groups of producers for each specific health service/activity: local health departments (“performed by LHD directly”), contractors (“contracted out by LHD”), and private providers (“provided by others in community independent of LHD”).

funding”). Health services may be performed by one group, two groups, or all three groups of providers together. That is, these providers are not mutually exclusive in providing health services for local residents. As stated earlier in chapter 2 (essay 1), this study puts a focus on LHD provision and publicly funded production, thus the dependent variables in this essay include only “LHD,” “Contracting out,” “LHD & Contracting out,” and “LHD & Others.” “Contracting out & Others” and “LHD & Contracting out & Others” are excluded in analysis because they account for a very small proportion of the distribution of service delivery modes. Appendix C displays all those possible delivery modes.

TABLE V. DISTRIBUTION OF PUBLIC HEALTH DELIVERY MODES

Delivery Modes	Freq.	Percent
LHD	13,711	35.74
Contracting out	896	2.34
LHD & Contracting out	311	0.81
LHD & Others	23,447	61.12
Total	38,365	100.00

The definitions of dependent variables are presented as below:

- (1) LHD (complete in-house production): A health service is solely provided by local health department (LHD).
- (2) Contracting out (complete outsourcing production): A health service is solely provided by contractor funded by LHD.
- (3) LHD & Contracting out (mixed production type 1): A health service is jointly provided by LHD and its contractor.
- (4) LHD & Others (mixed production type 2): A health service is jointly provided by LHD and others in community independent of LHD funding.

As table V displays, there are totally 38,365 cases (LHDs x services) in the final analysis (the number will be 77,123 cases if all publicly and privately funded production modes are counted). Specifically, “LHD” solely provides 35.74% of public health services in all the cases. Mixed production by “LHD & Others” accounts for 61.12% of all. Delivery modes related to contracting, however, are a very small component in public health service distribution. “Contracting out” makes up only 2.34%, and “LHD & Contracting out” makes up only 0.81% of all service delivery cases.

3.5.4 Independent Variables

In terms of transaction cost characteristics, “*asset specificity* refers to whether specialized investments are required to produce the service” (Brown and Potoski 2005, 329). It is rated from 1 (lowest) to 5 (highest). *Asset specificity squared* is added to the model because nonlinear correlation between asset specificity and public health service provision modes will be expected. *Service measurability* represents “the ability of the contracting organization to oversee vendor performance or observe how the vendor delivers the service” (Brown and Potoski 2005, 330). It is also coded from 1 (most easy) to 5 (most difficult). *Service measurability squared* is also added to the model to estimate the nonlinear correlation.

3.5.5 Control Variables

I calculate the ratios of nonprofits and for-profits to population times 100, or the number of nonprofits/for-profits per 100 residents, within jurisdiction as indicators *nonprofits* and *for-profits*. Percentages of minority groups, people older than 65 (*older people*), and population below poverty level in the past 12 months (*low-income people*) are drawn from 2011-15 ACS 5-Year Estimates. I add several interaction terms to estimate the joint influence of these variables on the choice of service delivery modes. Besides minority groups and older people, I also control the *jurisdiction* where LHDs are located. I code it as 0=city; 1=multi-city; 2=city-county; 3=county; 4=multi-county. The variables, operational definitions, measures, and data sources are exhibited in table VI.

TABLE VI. VARIABLES, DEFINITIONS, MEASUREMENT, AND DATA SOURCES

Variables	Operational Definitions and Measurement	Data Sources
<i>LHD</i>	A health service is solely provided by local health department (LHD)	2016 NACCHO
<i>Contracting out</i>	A health service is solely provided by contractor funded by LHD	2016 NACCHO
<i>LHD & Contracting out</i>	A health service is jointly provided by LHD and its contractor	2016 NACCHO
<i>LHD & Others</i>	A health service is jointly provided by LHD and others in community independent of LHD funding	2016 NACCHO
<i>Nonprofits</i>	The total number of nonprofit health care and social assistance organizations per 100 residents within jurisdiction	2012 Economic Census
<i>For-profits</i>	The total number of for-profit health care and social assistance organizations per 100 residents within jurisdiction	2012 Economic Census
<i>Hispanic American</i>	Percentage of Hispanic American in population within jurisdiction	2011-15 ACS 5-Year Estimates
<i>African American</i>	Percentage of African American in population within jurisdiction	2011-15 ACS 5-Year Estimates
<i>Asian American</i>	Percentage of Asian American in population within jurisdiction	2011-15 ACS 5-Year Estimates
<i>Native American</i>	Percentage of Native American in population within jurisdiction	2011-15 ACS 5-Year Estimates
<i>Older people</i>	Percentage of people older than 65 in total population	2011-15 ACS 5-Year Estimates
<i>Low-income people</i>	Percentage of population below poverty level in the past 12 months	2011-15 ACS 5-Year Estimates
<i>Jurisdiction</i>	LHD jurisdiction classification (city/multi-city/city-county/county/multi-county). It is coded as a category variable (0=city; 1=multi-city; 2=city-county; 3=county; 4=multi-county)	2016 NACCHO

TABLE VII. DESCRIPTIVE STATISTICS OF DEPENDENT, INDEPENDENT, AND CONTROL
VARIABLES

Variable	Obs.	Mean	Std. Dev.	Min	Max
<u><i>Dependent Variables</i></u>					
LHD	77125	0.499	0.500	0	1
Contracting out	77125	0.045	0.208	0	1
LHD & Contracting out	77125	0.017	0.131	0	1
LHD & Others	77123	0.317	0.465	0	1
<u><i>Independent Variables</i></u>					
Asset specificity	81972	3.530	0.537	2.000	4.670
Asset specificity squared	81972	12.751	3.791	4	21.809
Service measurability	81972	3.087	0.555	1.670	4.330
Service measurability squared	81972	9.838	3.393	2.789	18.749
<u><i>Control Variables</i></u>					
Nonprofits	81840	0.063	0.043	0	0.428
For-profits	81840	0.180	0.088	0	0.803
Low-income	81972	15.012	6.461	1.600	48.997
Hispanic American	81972	8.352	11.232	0	95.183
African American	81972	7.630	12.575	0	87.857
Asian American	81972	2.066	3.501	0	55.628
Native American	81972	1.693	5.129	0	55.628
Older people	81972	17.497	4.409	4.769	47.657
Jurisdiction	81972	2.620	1.139	0	4

TABLE VIII. LIKELIHOOD OF LOCAL PUBLIC HEALTH SERVICE PROVISION MODES

("LHD" AS THE BASE CATEGORY)

Variables	Contracting out	LHD & Contracting out	LHD & Others
	Coefficient (RSE)	Coefficient (RSE)	Coefficient (RSE)
Asset specificity	-1.219(0.838)	1.976(1.491)	2.152*** (0.239)
Asset specificity squared	0.224* (0.113)	-0.213(0.201)	-0.260*** (0.033)
Service measurability	-0.634(0.979)	0.282(1.651)	-8.539*** (0.258)
Service measurability squared	0.090(0.162)	-0.073(0.265)	1.349*** (0.041)
Nonprofits	6.131*** (1.334)	5.344** (1.989)	1.578* (0.742)
For-profits	-0.878(1.513)	1.214(0.862)	1.525*** (0.433)
Low-income	-0.047** (0.017)	-0.021(0.017)	-0.001(0.005)
Hispanic American	0.008(0.007)	0.011(0.008)	0.003(0.002)
African American	-0.034** (0.011)	0.005(0.009)	-0.000(0.002)
Asian American	0.010(0.019)	0.010(0.020)	-0.002(0.013)
Native American	0.001(0.018)	0.023(0.018)	0.015** (0.006)
Older people	0.019(0.024)	-0.013(0.029)	-0.032*** (0.007)
Jurisdiction	-0.490*** (0.073)	-0.033(0.110)	0.125*** (0.030)
Constant	1.211(1.996)	-8.348** (2.733)	9.180*** (0.489)
N	76993		
Log pseudo likelihood	-97562.391		
Wald Chi-square (91)	7615.93		
Pseudo R ²	0.0657		
Clusters	1842		

Note: * p < 0.05, ** p < 0.01, *** p < 0.001

TABLE IX. RELATIVE RISK RATIO (RRR) OF LOCAL PUBLIC HEALTH SERVICE PROVISION

MODES

("LHD" AS THE BASE CATEGORY)

Variables	Contracting out	LHD & Contracting out	LHD & Others
	RRR	RRR	RRR
Asset specificity	0.295	7.217	8.602***
Asset specificity squared	1.251*	0.808	0.771***
Service measurability	0.531	1.326	0.000***
Service measurability squared	1.094	0.930	3.854***
Nonprofits	459.799***	209.292**	4.843*
For-profits	0.416	3.367	4.596***
Low-income	0.954**	0.980	0.999
Hispanic American	1.008	1.011	1.003
African American	0.966**	1.005	1.000
Asian American	1.010	1.010	0.998
Native American	1.001	1.024	1.015*
Older people	1.019	0.987	0.969***
Jurisdiction	0.613***	0.968	1.133***
Constant	3.358	0.000**	9702.962***
N	76993		
Log pseudo likelihood	-97562.391		
Wald Chi-square (91)	7615.93		
Pseudo R ²	0.0657		
Clusters	1842		

Note: * p < 0.05, ** p < 0.01, *** p < 0.001

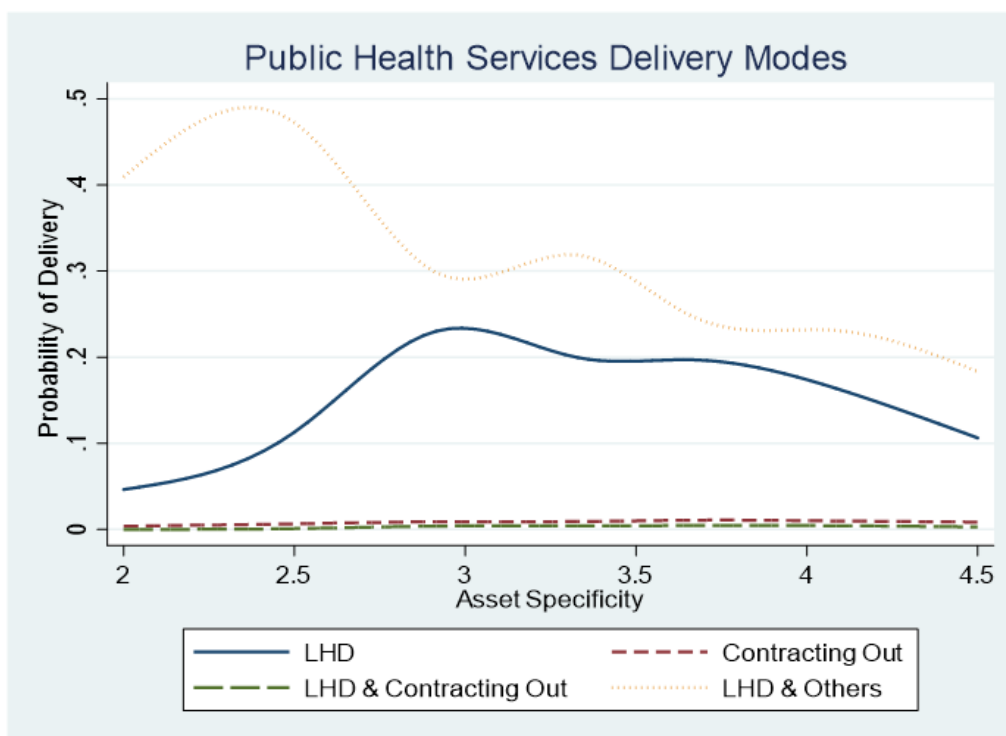


Figure 5. Predicted probability of local public health service provision by asset specificity

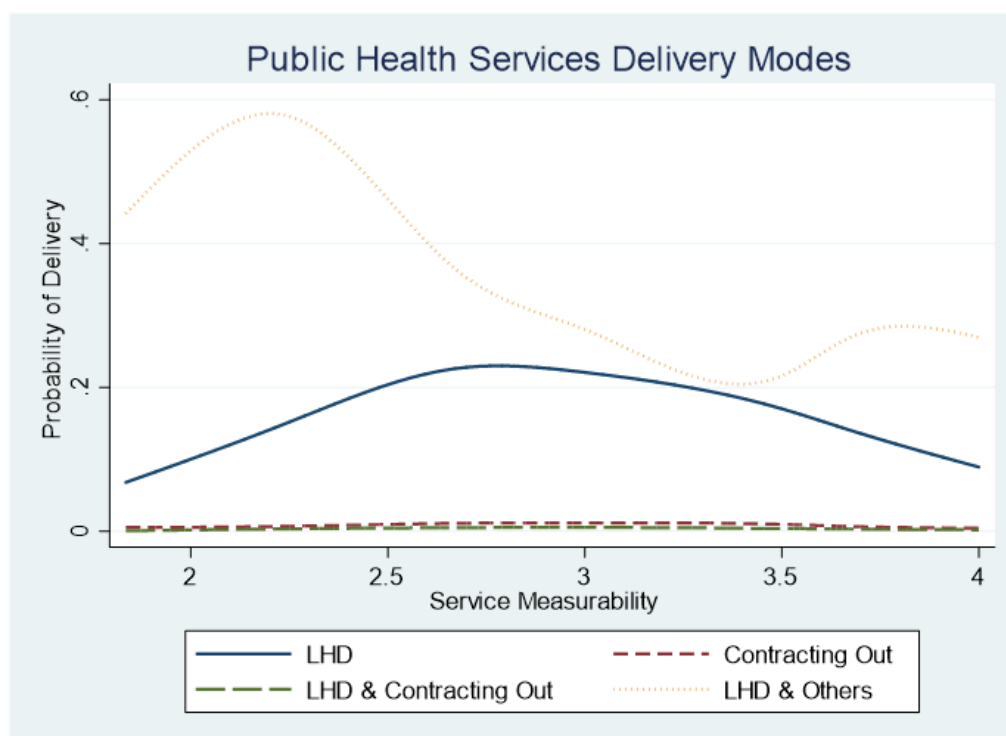


Figure 6. Predicted probability of local public health service provision by service measurability

3.6 **Multinomial Logit Model Results**

Table VII exhibits the descriptive statistics of dependent, independent, and control variables. Table VIII demonstrates results of multinomial logistic regression model in which LHD delivery is the baseline comparison category. The coefficients indicate the increase or decrease in the relative log odds of being in other delivery modes vs. local health department (LHD) direct delivery associated with a one-unit increase in each independent variable. In addition, the significant coefficients of squared terms suggest a nonlinear correlation between the changes of the primary independent variables asset specificity and service measurability and the relative log odds. Table IX reports the ratio of the probability of choosing one delivery mode over the probability of choosing the LHD direct delivery, or the relative risk ratio (RRR).

In order to better display and interpret the whole picture of public health service delivery modes, figure 5 & 6 show the predicted probability of production modes. In each figure, the y-axis represents the predicted probability of delivery means. The x-axis reports the changes of each factor from low to high.

Specifically, in figure 5 the x-axis represents the values of asset specificity for 44 public health services ranging from 2.00 (body mass index) to 4.67 (substance abuse services). The y-axis designates the probability of four public health services delivery modes. “LHD” represents services that are solely produced by local health departments, and there are no other providers in the market. “Contracting out” denotes services delivered by contractors. “LHD & Contracting

out” stands for services jointly produced by public health agencies and vendors. “LHD & others” exhibits services jointly produced by LHDs and other providers not funded by government.

Figure 5 presents how delivery modes for health services vary in accordance with the changes of asset specificity and the correlation is nonlinear. Consistent with hypotheses H1a, H1c&H1e, when asset specificity moves from low to moderate and from moderate to high levels, local health departments increase and then reduce in-house production.

In figure 6, the x-axis depicts the range of service measurability values from 1.67 (body mass index) to 4.33 (mental illness prevention). As the figure exhibits, when service measurability moves from low to moderate and from moderate to high levels, the curve rises and then drops correspondingly, which is similar as how the curve in figure 5 responds to variation of asset specificity. These results confirm H2a, H2c&H2e.

Figure 5 also indicates that LHDs employ contracting out in few cases as the two almost flat curves of “Contracting out” and “LHD & Contracting out” present, and figure 6 shows slightly variation of contracting cases as well. Thus, figure 5 & 6 do not signify noticeable fluctuation of contracting and mixed delivery (type1) activities, which cannot confirm H1b, H1d, H1f, H2b, H2d, H2f, H3a & H3b.

In addition, the coefficients in table IX indicate that high density of nonprofits makes LHDs more likely to choose either complete contracting (RRR=459.799) or mixed contracting (RRR=209.292) rather than LHD direct delivery mode. Moreover, LHDs with high levels of low-

income people ($RRR=0.954$) or African American population ($RRR=0.966$) are less likely to choose complete contracting. In larger jurisdictions, it is more likely to observe complete in-house delivery ($RRR=0.613$) or mixed delivery by LHD and others ($RRR=1.133$).

3.7 Discussion and Limitation

With a focus on contracting out, this study examines the link between two service characteristics and the delivery modes for public health services. Overall, service characteristics play a notable role in the make-or-buy decision in local health departments. The findings indicate that the delivery choice is not only decided by asset specificity and service measurability, but also influenced by the density of potential vendors including nonprofits as well as low-income people who are the most likely recipients of public services. This study has both theoretical and empirical implications.

First, this study brings a better comprehension with respect to a different mechanism in LHDs' decisions with regards to the make-or-buy alternatives from the decisions in other public agencies. Although it is common to view the public sector as a whole, the heterogeneity within the public services produced by different departments should not be ignored. Public health services, as many as 10 categories and 85 types, have the highest average transaction cost, which makes these services distinct from general public services. This may be the primary reason why the findings in this study are not fully consistent with prior studies such as Brown

and Potoski (2003b) and Carr, LeRoux, and Shrestha (2009) who examined public services provided by different government departments.

Second, this study confirms that asset specificity and service measurability are essential factors in the make-or-buy decision. Furthermore, the findings suggest that service measurability may align with asset specificity and play a similar role as does the latter. Put it differently, specialized assets are necessary for both producing and monitoring public health services. Brown and Potoski (2003b) argue that internal production increases when public services become difficult to measure and hard to monitor. In their analysis, governments reduce their reliance on all forms of external production in such circumstances. Yet, the findings in this study convey that public health agencies would decrease internal production rather than increase in-house production.

Third, this study develops our understanding of the contracting decision in public health agencies and contributes to contracting literature. Basically, local health departments would not use much contracting in daily practices. Differently from other public agencies, local health departments emphasize their mission to improve and protect the health and wellbeing of the public, rather than to pursue costs saving or make profits. Moreover, the costs of contracting out services and monitoring vendors' performance may exceed in-house production costs due to the high complexity of many public health services. In recent years, the public needs or demands for health services have become even higher, particularly in current period when the aged population reaches at its highest level in human history, public health emergencies occur more

frequently, and health care is far more expensive in the U.S. than any other industrialized countries. Correspondingly, local health departments insist performing by themselves until asset specificity and service measurability hit very high levels. Their preference for keeping production within public health departments reveals their concern with and caution towards privatization and the consequences that it might bring out.

Fourth, this empirical analysis builds a bridge between transaction cost approach and market and government failure theories in order to obtain a better understanding of the whole picture of public health service delivery. The findings depict that transaction cost characteristics can explain the rationale of market failure theory and government failure theory, and the subsequent behaviors of publicly funded providers.

Last but not least, consistent with the findings in essay 1, this research identifies the density of nonprofits as well as low-income population as two conditions that may motivate LHDs to apply more contracting. At high levels of asset specificity and service measurability, an almost zero level of government direct provision may lead the under-satisfied health service demanders to outsourcing and non-governmental markets. The government failure theory suggests that the nonprofit sector will be most active for satisfying the service needs of diverse groups and averting conflicts over government service policy (Douglas 1983; Hansmann 1987; Salamon 1987; Young 2012). Besides, the nonprofit sector's pro-social feature makes it serve as a remedy to the failures of government and private market (Anheier 1995; Ben-Ner and Van Hoomissen 1991). "The public sector may come to rely more heavily on market-based

alternatives to service provision by nonprofits and reduce their own internal program capacity” (Gazley and Brudney 2007; Lecy and David 2013; Van Slyke 2003).

There are two primary reasons for the preference for nonprofits as potential outsourcing partner. First, nonprofits are more likely than for-profits to be inclined to provide collective consumption goods—population health services. The inherent disadvantage of private-good substitutes for collective goods is that “the free-rider problem associated with collective goods does lead us to expect that non-governmental providers of such goods face a financial obstacle” (Weisbrod, 1975). It would be hard for for-profits to charge for collective goods such as disease epidemiology and surveillance. Nonprofit organizations can fill the gaps in the market created by the failures of government provision of high transaction cost health services. For example, nonprofit hospitals have capability and willingness to share relevant information and become primary actors without pursuing profits on these activities. Second, for-profits are more likely than nonprofits to provide individual consumption goods—patient-oriented health services. “We may expect that the private-good activities of government will be supplemented to a relatively greater extent in the private for-profit sector” (Weisbrod, 1975). For-profit business can charge high prices for those services to finance the operation and even make profits.

Additionally, consumers will see more contracting in areas with the highest percentage of low-income people. Considering that those people may not be able to afford the private services in the market, LHDs are more likely to have incentives to exercise contracting to provide free or low-price public health services. Moreover, when low-income consumers are

also the “median voter” in a jurisdiction, government will perceive the political pressure from the majority of local residents and take actions as they prefer.

The analysis in this research is limited to the information conveyed in data. The NACCHO data did not include description of who are “others.” Without detailed information regarding the composition of other providers as well as potential vendors, it is difficult to distinguish the roles of nonprofit and for-profit health services organizations in LHDs’ make-or-buy-or-mixed decisions and how nonprofits will respond to market and government failures. Future research should consider asking such questions to collect more useful information.

4. ESSAY THREE: CONTRACTING OUT PUBLIC HEALTH SERVICES AND LOCAL HEALTH OUTCOMES

4.1 Introduction

Driven by New Public Management and Government Reinvention principles, contracting out for many types of public services, including health care has become commonplace, particularly at the local level where fiscally constrained municipalities and counties have sought ways to keep up with increasing service demands in the face of declining resources. Chapter 2 and 3 have responded to one primary inquiry on the subject of outsourcing by examining multiple factors that influence decision making in local health departments. This chapter goes one step forward to scrutinize another important inquiry concerning government contracting through connecting the make-or-buy decision by LHDs with health outcomes in local communities.

Conventional wisdom suggests that contracting out public services leads to greater effectiveness in service delivery, as contracting firms are forced by market pressures to be responsive, provide high quality services, and otherwise demonstrate their value in the marketplace of prospective buyers. Some studies concentrate on the economic costs and benefits, while fewer attach importance to the quality of contracting program or organizational performance. Although these studies have advanced our knowledge of relationship between collaboration and effectiveness, the findings did not produce a consensus on the explanations

for the correlation. “It is often taken as a truism that collaboration fosters better outcomes” (May and Winter 2007, 484). While some studies have confirmed this (Andrews and Entwistle 2010; Mitchell, O’Leary, and Gerard 2015; Page 2004; Selden, Sowa, and Sandfort 2006), others have brought contradictory evidence to bear on this argument (Bel, Fageda, and Warner 2010; Brudney et al. 2005; Meier and O’Toole 2001; O’Toole and Meier 2004). Thus, it is still inconclusive if contracting can improve public service effectiveness or organizational performance. Furthermore, little empirical research has examined the success of these initiatives in terms of service quality in the public health arena. This study puts a focus on contracting activities in local health departments (LHDs), a field where literature has yet to explore such an inquiry.

This study is significant as I concentrate on largely complex health and human services rather than simple public services. As mentioned earlier in previous chapters, local health departments (LHDs) across the nation work hard on the front lines of the U.S. public health system to promote and protect the health and well-being for all people in their communities while face expanding population health needs, increasing public health emergencies, fiscal constraints, and diminished capacity (Reich 2002). Those problems, pressures, and challenges created incentives for LHDs to engage in outsourcing practices in order to cut down costs and maintain service quality. Such a changing environment enacted a variety of solutions including contracting out more health services to private firms and nonprofit organizations as well as other government agencies (Issel et al. 2015). Moreover, contracting can allow LHDs to enhance their

focus on core public health functions, therefore may help LHDs better deliver health services through collaborative, cross-sector efforts (Ingoglia 2004).

Some privatization theorists argue that the private sector can deliver public goods and services more efficiently and effectively than the public sector, “others contend that certain services such as public health services should not be contracted out to the private sector” (Keane, Marx, and Ricci 2002, 1252). Contracting out is successful in some locales but faces reluctance from other local health agencies. In addition, outcomes related to the health and well-being of the local population can be difficult to provide evidence of whether or not contracting out achieves public goals of improved service quality. Does contracting by local health departments lead to better public health outcomes? How effective are the contracting out practices in local health departments? The goal of this study is to better understand how contracting out decision affects the health outcomes at the county level and offer implications on policymaking and implementation for public health practitioners.

In this chapter, I address these questions through a national study of contracting by local health departments, using data from National Profile of Local Health Department Study, combined with county level health outcome data from the County Health Rankings & Roadmaps (CHRR). These data, paired with various controls for health outcomes allow me to examine whether public sector contracting by local public health departments is linked to better health outcomes at the community level on four specific health issues— frequent mental distress, sexually transmitted infections, teen births, and adult smoking. The findings indicate that

contracting out can lead to improved health outcomes, but only for services with specific characteristics. When services with lower transaction costs (lower asset specificity and easier service measurability) are contracted out, there is a positive effect on community level health outcomes.

In the next section, I review major theories and previous empirical research relevant to public sector collaboration and effectiveness. Next, I develop a theoretical framework for understanding the relationship between characteristics of services and health outcomes and propose a set of hypotheses. This is followed by description of the data, measures, and methods of analysis. Next, I interpret the results and conclude with a discussion of their implications for managing hollow state health care actors.

4.2 Contracting Activities and Outcomes

A number of empirical studies have examined the outcomes of contracting activities in federal, state, and local public agencies from the perspectives of efficiency, effectiveness, responsiveness, accountability, and equity. The majority of studies focused on the consequences of contracting are concerned with the efficiency question or cost savings. Public choice theory, developed from microeconomic theory in the 1960s, suggests that public agencies have monopoly power in delivering public goods and services, which results in oversupply and inefficiency (Boyne 1998c; Buchanan and Tullock 1962; Stigler 1971; Tullock 1965). The solution proposed by public choice theory is to replace monopoly with competition in

public service markets. “In the presence of competition, public agencies contracting for services should result in improved efficiency—cost savings or lower spending—for those services produced by external providers” (Averch 1990; Boyne 1998a; Brudney et al. 2005, 393; Ferris 1986; Savas 2000). “Contracting overcomes bureaucratic inefficiencies by allowing public organizations to access scale economies, bypasses costly labor and supply requirements, and yields efficiency gains through competition incentives” (Brown and Potoski 2003b, 154). Boyne (1998a) summarizes empirical evidence and suggests that “production by a private firm appears to lead to lower spending and higher efficiency in the fire service, highway construction and maintenance, property maintenance, and janitorial services” (479). Savas (2000) examines contracting practices in California, New Jersey, New York as well as other countries and indicates that public officials were satisfied with the cost savings. Hodge’s (2000, 2018) international review of privatization performance also exhibits cost savings through outsourcing. Brudney et al. (2005) on the other hand, find that only one-third of state agencies in their analysis reported service cost savings as result of contracting. Bel, Fageda, and Warner (2010) examine 27 previous studies of solid waste and water distribution and find no systematic support for lower costs with private production.

Compared with many studies concerning lower spending or cost savings, there are few empirical studies that demonstrate the impact of outsourcing on program effectiveness or service quality (Amirkhanyan 2008; McGuire 2006; O’Toole and Meier 2004). “The evidence on contracting is complex but suggests the possibility of cost savings, at least under some

circumstances. Much less frequently examined, however, is the related question of service quality, despite the fact that the theoretical arguments also tout the prospect of positive impacts here” (O'Toole and Meier 2004, 342). Romzek and Johnston (2005, 423) contend that the reasons for this may include: (1) it is hard for contractors to control and measure outcomes; (2) there are disagreements about performance standards; and (3) there is “a time lag between the program intervention and the desired outcomes”.

The limited empirical research on service contracting outcomes, however, yields mixed results. On the one hand, outsourcing can achieve varying degrees of performance for stakeholder expectations and has an impact on outcomes (Mitchell, O'Leary, and Gerard 2015; Page 2004; Selden, Sowa, and Sandfort 2006). Selden, Sowa, and Sandfort (2006) find that collaborative approaches could have a positive impact on early care and education. On the other hand, some studies suggest that the existence of outsourcing itself does not necessarily lead to better outcomes. Meier and O'Toole (2001) find that networks rather than contracts are associated with higher service performance. O'Toole and Meier (2004) use the Texas Assessment of Academic Skills (TAAS) as a performance indicator to evaluate the effects of contracting out and estimate how contracting is associated with TAAS. They (2004, 297) control for “race/ethnicity of students, poverty, tax wealth per student, tax rate, revenue per student, and state aid percent”. Their conclusion in this case suggests that “contracting is not positively related to school district performance” (344). O'Toole and Meier (2004) suggest that the “systematic study of effects on service quality is worthy of further exploration” (344).

Governments may choose outsourcing in order to avoid a negative image and improve responsiveness and accountability. Through case studies in Kansas, Romzek and Johnston (2005) indicate that the state has achieved accountability effectiveness in social service contracting. In addition, multiple stakeholders are involved in the contracting out practices: elected politicians concerning political accountability and responsiveness, public managers focusing on efficiency and effectiveness, vendors seeking stable funding from outsourcing contracts, service recipients pursuing the equity and service quality, and other interest groups (Brown, Potoski, and Van Slyke 2006).

Scholars have identified that “public, private, and nonprofit organizations with distinctive advantages can enhance the effectiveness, efficiency, and equity as outcomes of outsourcing” (Andrews and Entwistle 2010, 679). Nonprofits in particular are viewed as more favorable and reliable vendors in outsourcing for health and human services because “nonprofit organizations are thought to share similar missions with government, and ... might draw on its own private philanthropic resources to augment services it delivers under government contract” (Brown, Potoski, and Van Slyke 2006; Salamon 1995). Similarly, LeRoux (2009, 166) argues that nonprofits are more likely to hold public values transmitted by government funding and “these values favor democratic participation, responsive service delivery, and equitable distribution of resources.”

4.3 **Collaboration and Effectiveness in Public Administration Literature**

Collaborative management is a concept that “emphasizes engaging participants across the boundaries of organizations or sectors to solve problems in a formal, consensus-oriented, and deliberative relationships” (Agranoff and McGuire 2004; Ansell and Gash 2008; Ran and Qi 2018). Collaboration includes a variety of ways to partnerships across organizations, such as networks, contracts, alliances, committees, coalitions, consortia, and councils (Agranoff and McGuire 2004). The fundamental reason for the increasing collaboration between the public sector and the private sector may be the realization that many public issues are too complex for a single entity to adequately address (O’Leary and Bingham 2009; O’Leary and Vij 2012; Silvia 2018). Therefore, the public sector, through efforts to increase purposive collaboration, may gain more resources—facilities, information, expertise, professionals, and specialists—that will improve the effectiveness of public service delivery.

Through the theory of resource dependence, Pfeffer and Salancik (1978) provide theoretical explanations for the relationship between collaboration and effectiveness. Pfeffer and Salancik (1978) argue that organizations require resources in order to survive (258). Moreover, social linkages with external organizations are important for the focal organization as a means of stabilizing the environment, reducing uncertainty, and ensuring favorable resource exchanges (713). As a result, acquired resources may improve both the efficiency (an internal standard for evaluation) and the effectiveness (an external standard of how well organization is meeting the demands of the various organizations that are concerned with its activities) (11).

Scott and Davis (2007, 233) assert that “resource dependence offers a natural system perspective that highlights the organizational politics behind choices such as the make-or-buy decision”. They (2007, 233) state “three core ideas to explain how organizations manage their relationships with other organizations”: social context, autonomy, and power. Organizations seek collaboration in response to the social and task environment that they find themselves in. Although Pfeffer and Salancik (1978) worry that an organization’s dependence on resources from others may lead to the shift of power across boundaries, Scott and Davis (2007, 233) contend that it is “possible for two actors both to hold power over each other—through an increase in their interdependence”. As a widely used way of collaboration, contracts can set up a formal relationship between the focal organization—public agencies—and contractors. Furthermore, in the contracting relationship, public organizations acquire resources such as goods, services, facilities, and expertise, while contractors receive funding from government. Public agencies can maintain the autonomy and power and pursue their goals of increasing effectiveness through contracting out activities.

Typically, current studies hypothesize that “collaboration is a positive factor to be pursued by managers” with the rationale that “collaboration is the new form of governance, it follows that collaboration in and of itself must be desirable” (McGuire 2006, 39). They argue that collaboration contributes to solving public problems by producing more effective, efficient, and flexible policies and improved outcomes or effectiveness (Ansell and Gash 2008; Purdy 2012; Ran and Qi 2018; Sousa and Klyza 2007). Yet, Dickinson and Glasby (2010) point out that in

many cases collaborative approaches are adopted because of internal and external pressures based on the assumption that collaboration will be effective rather than of belief that they are effective (Silvia 2018). As a result, many governments invest substantial time and money in collaborative networks without knowing whether what they are doing is effectively tackling the problem or how to measure the collaborative effectiveness (Koontz and Thomas 2006).

4.4 Collaboration and Effectiveness in Public Health Literature

In the arena of public health, many issues represent complex and wicked problems because they are constructed with a set of conflicts: inadequate provision, rising needs, social and economic influences, different values, a lot of interest groups, and inequalities. As Brunton and Galloway (2016) have suggested, “Public health systems present the epitome of problem ‘wickedness’: no matter how many resources are dedicated to their resolution, there are never enough”(163). Given the focus on the management of health in populations rather than the care of individual patients, public health is a much more complex set of tasks revolving around “the activities of the detection, prevention, treatment, control, intervention, surveillance, and assessment of health threats” (Avery 2000, 332).

The dynamic complexity of public health issues that this study will explore can be better understood through Weber and Khademian (2008b) identification of three characteristics of wicked problems. First, wicked problems may be unstructured. It may be fairly difficult to figure out causes of wicked problems, thus “each attempt at creating a solution changes the

understanding of the problem” (Rittel and Webber 1973). For example, chronic disease has innumerable causes such as unhealthy lifestyle, work pressure, unsafe environment, and so on. Thus, it may be tough to find a simple and explicit way of prevention. Second, wicked problems may cross multiple policy domains and levels of government. Environmental health issues such as air, water, and solid waste pollution are often transjurisdictional. Cleaning pollution and rehabilitating environment may need the collaboration among all levels of public agencies, private firms, grassroots organizations, and communities. Third, wicked problems may be not going to be solved once and for all. Each case is essentially unique. The prevention for one type of communicable disease may not work for another type of disease. The prevention for the same disease in one season may not work for it in another season. “Public health systems present the epitome of problem ‘wickedness’: no matter how many resources are dedicated to their resolution, there are never enough” (Brunton and Galloway 2016, 163).

Whereas the development of interorganizational collaboration has a lot of empirical evidence in the public health literature, “the evidence-based studies in public health are typically epidemiological, thus lack systematical theories and frameworks” (Varda, Shoup, and Miller 2012, 564). Varda, Shoup, and Miller (2012, 564) suggest that “much of the literature on collaboration and partnership within and among sectors from the field of public policy, management, and administration of public agencies, is uniquely suited to inform public health efforts”. Mays et al. (2006, 523) contend that a public health system’s performance is likely to “be shaped by the resources available to the system, the ways in which the resources are

organized, and the characteristics of the community or market served by the system”. Sinclair and Whitford (2015, 1638) assert that “collaboration theory suggests that greater participation of the LHD in the system (greater centrality) and greater participation of a variety of organizations and agencies could lead to higher levels of effectiveness in accomplishing core local health functions”.

Empirical studies have exhibited mixed results regarding how contracting could influence health outcomes. Rohrer (2004) explains that the state of Wisconsin funds LHD for agreed-upon outcomes of contracting and emphasizes that contracting for outcomes could be an effective mechanism, although health outcomes are difficult to specify. Agbodzakey (2012) compares collaborative governance of HIV health services in two South Florida Counties and finds that collaboration among stakeholders enhances efforts in effectively managing and/or addressing complex relevant problems. However, Duggan (2004) demonstrates that the state of California contracting with health maintenance organizations was associated with a substantial increase in government spending but no corresponding improvement in infant health outcomes.

Thus, according to the theory of resource dependence and public management literature on collaboration, I maintain that public health agencies may have inadequate resources and diminished capacity to deal with the wicked problems of public health issues, hence LHDs can seek additional resources through contracting arrangements with the private sector (nonprofit and for-profit) in order to deliver health services more efficiently and effectively. Even if I can apply resource dependence theory to empirical contracting practices to understand

the relationship between collaboration and effectiveness, it is still not clear why prior outsourcing practices have shown mixed results and how governments can obtain positive health outcomes through outsourcing as expected. In the following section, I will provide a theoretical framework for understanding the relationship between services with specific characteristics and possible contracting outcomes.

4.5 Transaction Costs and Outsourcing Outcomes: A Theoretical Framework

As described in previous chapters, the concept of transaction cost was initially introduced by Coase (1937) and developed Williamson (1979, 1981, 1985, 1996, 2008). Williamson (1981) defines that “a transaction occurs when a good or service is transferred across a technologically separable interface” (552). Transaction costs can be understood through three critical dimensions: uncertainty, recurrence, and asset specificity. He argues that when the degree of unpredictability of transaction outcome (uncertainty) is high, the frequency with which transactions recur (recurrence) is high, and the fixed investment that are specialized to a particular transaction (asset specificity) is large, transaction costs rise accordingly. Brown and Potoski (2003b) suggest understanding transaction costs the management costs across the boundaries of sectors.

Asset specificity refers to whether investments are specialized to a particular transaction (Williamson 1981). Low asset specificity allow buyers easily to turn to alternative sources and suppliers to sell output intended for one buyer to other buyers without difficulty (Williamson,

1981). With high asset specificity, nevertheless, the supplier is effectively "locked into" the transaction to a significant degree. As a consequence, the buyer cannot turn to alternative sources of supply and obtain the item on favorable terms, since the cost of supply from unspecialized capital is presumably great. The buyer is thus committed to the transaction as well (Williamson 1981).

Service measurability is defined as "how difficult it is for the contracting organization to measure the outcomes of the service, to monitor the activities required to deliver the service, or both of these" (Brown and Potoski 2003b, 444). Easy service measurability can help the contracting organization identify and assess performance, reduce disturbance and uncertainty, thus lower transaction costs. Difficult service measurability may create obstacles for contracting organizations oversee production and monitor outcome and therefore lead to higher transaction costs.

Bel, Fageda, and Warner (2010) conduct a meta-analysis to investigate if privatization of local government service can reduce costs focusing on the delivery of solid waste services and water distribution, "the two local government services with the greatest contracting experience" (553). However, they did not find systematic support for lower costs with private production. Bel, Fageda, and Warner (2010) suggest that cost savings expectations are dependent on the nature of the service (553). I argue that health service effectiveness is influenced by service characteristics as well.

Vining and Globerman (1999) and Brown and Potoski (2005) present a systematic framework based on asset specificity and service measurability to construct a two-by-two matrix of classification of transaction costs, as displayed in table X. The framework has thus far been used to predict which services governments are most likely to contract out. I extend the use of this theoretical framework to examine the effects of outsourcing low, mixed, and high transaction cost public health services. I first describe the characteristics of four categories of services, then employ the framework for analysis.

TABLE X. CLASSIFICATION OF TRANSACTION COSTS

	<i>High Asset Specificity</i>	<i>Low Asset Specificity</i>
<i>Difficult Service Measurability</i>	High Transaction Cost Services	Mixed Transaction Cost Services (type 1)
<i>Easy Service Measurability</i>	Mixed Transaction Cost Services (type 2)	Low Transaction Cost Services

Source: Brown and Potoski (2005)

4.5.1 High Asset Specificity and Difficult Service Measurability

Vining and Globerman (1999) point out that medical health care related activities generally have high asset specificity and difficulty service measurability. Brown and Potoski (2005) conducted a survey in which 36 city managers and mayors across the country rated 64 public services. The results show that public health programs have high transaction costs as a

whole. Specifically, drug and alcohol treatment, as well as operation of mental health programs/facilities have high transaction costs as well. Brown and Potoski (2005) maintain that high transaction cost services pose the highest risk of contract failure (342) because (1) high asset specificity may bring less bidders and reduce competition; and (2) it will be hard for public health agencies to monitor outcomes. Yet, Brown and Potoski (2005) also suggest that the risks of outsourcing failure could be offset if (1) public managers are much more vigilant in monitoring vendor performance than in other circumstances; (2) public managers find more bidders; (3) public managers choose nonprofits as vendors as they have fundamentally altruistic motives; and (4) vendors have specialized expertise in tackling tough cases. Accordingly, I argue that outsourcing high transaction cost services may have consequences for lower service quality; in this case, worse health outcomes. Nevertheless, a more robust market (increased competition) may help offset the high risks of contract failure. Therefore, I hypothesize that:

H1: Contracting out health services with high transaction costs (high asset specificity and difficult service measurability) are more likely to result in poorer health outcomes.

4.5.2 Low Asset Specificity and Difficult Service Measurability

Outsourcing services with low asset specificity and difficult service measurability may result in better outcomes than outsourcing services with high transaction costs. Although public agencies may need substantial managerial investments in monitoring vendor performance, low asset specificity implies high contestability and more alternative arrangements (Vining and

Globerman 1999). An example of such services is animal control in Brown and Potoski's (2005) survey. In the case of animal control, vendors do not need large investments. But monitoring wild animals and reporting the performance may be a tough issue. For such services, "if a contract fails, public managers have a stable of other vendors to step in to bid on future contracts. However, these types of services still pose risks as public managers still need to dedicate resources to address challenges associated with the problematic service criteria" (Vining and Globerman 1999, 333).

4.5.3 High Asset Specificity and Easy Service Measurability

Given high asset specificity, public managers may be hard to find a vibrant supply market. Even if the complexity of service measurability is low, public managers may be worried about potential alternatives to replace the vendors with unsatisfied performance. In Brown and Potoski's (2005) survey, respondents rate ambulance service/emergency medical service as high specificity and easy measurement. Ambulance service needs specialized vehicles, medical professionals with expertise, as well as medical facilities. There may be few vendors providing ambulance services in rural areas or small jurisdictions. Gauging vendor's performance may be fairly straightforward—mortality, but contracting for such services may still not be a recommendation because the risk of monopolization is high. Thus, I hypothesize that:

H2: Contracting out health services with mixed transaction costs (low asset specificity/difficult service measurability or high asset specificity/easy service measurability) are likely to have no effect on health outcomes.

4.5.4 Low Asset Specificity and Easy Service Measurability

Outsourcing services with low transaction costs are more likely to lead to “high potential for efficiency and cost savings and low risk of contract failure” because public managers can easily specify the outcomes and replace current vendors with alternatives on the vibrant market once their performance is unsatisfied (Brown and Potoski 2005, 332). One example for low transaction cost service is sanitary inspection. Service quality regarding sanitary inspection is easy to gauge because it is quite obvious to observe the hygienic conditions. Hence, I hypothesize that:

H3: Contracting out health services with low transaction costs (low asset specificity and easy service measurability) may lead to improved local health outcomes.

4.6 Data and Methodology

The data in this study are from several sources. In terms of the activities of contracting out by LHDs, this study utilizes data from the 2016 National Profile of Local Health Department Study that was conducted by the National Association of County and City Health Officials (NACCHO). The 2016 survey had a response rate of 76% (National Association of County and City Health Officials 2017a). After data- cleaning procedures, the analysis includes 1,662 local health departments. The NACCHO dataset contains many useful variables including method of service provision for dozens of health functions (in-house, contracted, not provided, etc.), funding sources, executive characteristics, and staffing.

TABLE XI. AVERAGE RATINGS OF ASSET SPECIFICITY AND SERVICE MEASURABILITY

Service	Asset Specificity	Service Measurability
<i>1. Immunization Services</i>		
Adult immunization	3.17	2.17
Childhood immunization	3.33	2.17
<i>2. Screening for Diseases/Conditions</i>		
HIV/AIDS	3.50	2.83
Other STDs	3.33	2.83
Tuberculosis	3.33	2.33
Cancer	4.00	3.00
Cardiovascular disease	3.33	2.50
Diabetes	2.83	2.33
High blood pressure	2.50	2.00
Blood lead	3.50	2.83
BMI (Body Mass Index)	2.00	1.67
<i>3. Treatment for Communicable Diseases Services</i>		
HIV/AIDS	4.50	3.17
Other STDs	4.00	2.83
Tuberculosis	4.33	3.17
<i>4. Maternal and Child Health Services</i>		
Family planning	3.33	2.67
Prenatal care	3.67	3.00
Obstetrical care	3.83	3.00
WIC (Women, Infants & Children)	3.17	2.67
MCH (Maternal and Child Health) home visits	3.50	2.83
EPSDT (Early and Periodic Screening, Diagnostic and Treatment)	3.50	3.17
Well child clinic	3.17	3.00
<i>5. Other Health Services</i>		
Comprehensive primary care	4.00	3.17
Home health care	4.17	3.50
Oral health	4.17	3.33
Behavior/mental health services	4.50	3.67
Substance abuse services	4.67	3.50
<i>6. Epidemiology and Surveillance Activities</i>		
Communicable/infectious disease	4.17	3.33
Chronic disease	3.50	3.50
Injury	3.33	3.00
Behavior risk factors	3.33	3.33
Environmental health	4.00	3.00
Syndromic surveillance	3.67	3.33
Maternal and child health	3.67	3.17
<i>7. Population-Based Primary Prevention Activities</i>		
Injury	2.83	3.50
Violence	3.33	4.00
Unintended pregnancy	3.17	3.83
Chronic disease	3.33	3.67
Nutrition	3.33	4.00
Physical activity	3.17	3.50
Tobacco	3.00	3.17
Substance abuse	3.83	4.00
Mental illness	4.17	4.33
<i>8. Regulation, Inspection and/or Licensing Activities</i>		
Tobacco retailers	3.17	2.83
Smoke-free ordinances	3.00	3.00

TABLE XII. EXAMPLES OF CATEGORIZATION OF TRANSACTION COSTS

	<i>High Asset Specificity</i>	<i>Low Asset Specificity</i>
<i>Difficult Service Measurability</i>	Mental illness prevention (asset specificity=4.17; service measurability=4.33)	Pregnancy prevention (asset specificity=3.17; service measurability=3.83)
<i>Easy Service Measurability</i>	HIV/AIDS/STDs treatment (asset specificity=4.25; service measurability=3.00)	Tobacco prevention (asset specificity=3.00; service measurability=3.17)

In order to measure transaction costs of public health services, I collected data from a small group of public health experts to evaluate two transaction costs characteristics—asset specificity and service measurability for 44 local health services (see Appendix B). This strategy follows Brown and Potoski's (2003b) approach to quantifying transaction costs. Table XI shows the average ratings of asset specificity and service measurability for 44 services in eight categories. Based on values in table XI, I identify four examples of services in table XII: mental health prevention services (high asset specificity and difficult service measurability), HIV/AIDS/STDs treatment services (high asset specificity and easy service measurability), pregnancy prevention services (low asset specificity and difficulty service measurability), and tobacco regulation services (low asset specificity and easy service measurability).

To measure health outcomes for the counties, I employ data from the 2018 County Health Rankings & Roadmaps (CHRR). The County Health Rankings were created by the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute. The data are “compiled using county-level measures from a variety of national and state data sources” and standardized to “measure the health of nearly all counties (and county equivalents) in the nation and rank them within states” (County Health Rankings & Roadmaps 2018). The Rankings are based on a model of population health that includes health outcomes (length and quality of life) as well as health factors (health behaviors, clinical care, social and economic factors, and physical environment). Demographic characteristics were obtained from the 2018 County Health Rankings & Roadmaps and the 2011-2015 American Community Survey 5-Year Estimates by the U.S. Census. Information of for-profit and nonprofit health care and social assistance organizations was achieved from the 2012 Economic Census. The unit of analysis in this research is a local (county or multi-county) health department (LHD).

4.6.1 Unit of Analysis

The unit of analysis in this research is a local (county or multi-county) health department (LHD). To set up a final dataset for examining the correlation between LHD contracting activities and health outcomes, I combine the above datasets by Federal Information Processing Standard (FIPS) county code that is included in multiple datasets. However, not all LHDs are county-level government agencies. Approximately 69% of LHDs are county-based, 8% of LHDs serve multiple-counties, and 20% of LHDs serve cities or towns (in New England) (National

Association of County and City Health Officials 2017b). I turn some county-level health outcomes into multi-county average values by using the 2018 CHRR data in order to match with those LHDs that serve multiple-counties in the 2016 NACCHO data. As a result, only county and multi-county LHDs, and corresponding county health outcomes exist in the final dataset for analysis.

4.6.2 Dependent Variables

Four distinct public health services are identified with transaction costs ranging from low to high levels in table X & XII. I estimate the impact of transaction costs, market competition and several controls on these four health outcomes in order to examine the effect of contracting on community health outcomes. The dependent variables in this research are thus four specific health measures: frequent mental distress (outcome relating to outsourcing mental health prevention services), sexually transmitted infections (outcome relating to outsourcing HIV/AIDS/STDs treatment services), teen births (outcome relating to outsourcing unintended pregnancy prevention services), and adult smoking rate (outcome relating to outsourcing tobacco regulation services). “Frequent Mental Distress” is the percentage of adults who reported more than 14 days in response to the question “Now, thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?” This measure was from the Behavioral Risk Factor Surveillance System (BRFSS) by the CDC (CHRR, 2019). “Sexually Transmitted Infections (STI)” are measured as the number of newly diagnosed chlamydia cases

per 100,000 population of a county in a given time period (CHRR, 2019). The STI data were provided by the National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (NCHHSTP). “Teen Births” is the number of births to female ages 15-19 per 1,000 females in a county in a given time period (CHRR, 2019). Data of teen births were provided by the National Center for Health Statistics (NCHS) and drawn from the National Vital Statistics System (NVSS). “Adult smoking” measures the percentage of the adult population in a county who both report that they currently smoke every day or most days and have smoked at least 100 cigarettes in their lifetime (CHRR, 2019). The data were drawn from the BRFSS as well.

4.6.3 Independent Variables

The purpose of this study is to test hypotheses about the impact of contracting activities on health outcomes. “Contracting out” is defined as “pay another organization to perform this activity or service on behalf of your LHD” (National Association of County and City Health Officials 2017a). Corresponding to health outcome “Frequent Mental Distress,” I measure outsourcing mental illness prevention as independent variable,. In terms of “Sexually Transmitted Infections (STI),” I include treatment for HIV/AIDS and other STDs. With respect to “Teen Births,” I concern outsourcing unintended pregnancy prevention. In order to explore the correlation between outsourcing tobacco regulation activities and adult smoking rates, I consider regulation, inspection, or licensing of tobacco retailers and smoke-free ordinances. I measure contracting out as “%Buy/(Make+Buy)” by calculating the percentage of services funded by LHD that are contracted out.

$$\% \frac{Buy}{Make + Buy} = \frac{Services Contracted Out by LHD}{Services Performed or Contracted Out by LHD} \times 100\%$$

While the extent of contracting for each of these four categories of services are the primary variables of interest, I control for market competition and a series of demographic factors that are likely to shape community health outcomes, including the percentage of the county population with some college, percent unemployed, percent aged 65 and over, percentage non-Hispanic white, as well as log of population. All the models are estimated using ordinary least squares regression with robust standard errors.

4.7 **Findings**

Descriptive statistics are shown in table XIII. In terms of dependent variables, the percentage of frequent mental distress ranges from 8.04% to 19.18% in adults. Sexually transmitted infections range from 55 to 1422 chlamydia incidences per 100,000 population. Teen births range from 2.82 to 128.65 in a county. Adult smoking ranges from 6.74% to 31.74%. The extent to which LHDs buy or contract out for health services varies across counties. On average, LHDs contract out 18.01% of mental illness prevention services, 10.02% of HIV/AIDS/STDs treatment services, 4.01% of pregnancy prevention services, and 6.01% of tobacco retailers and smoke-free ordinances regulation services. In terms of control variables, on average 58.67% of population have some college degree; 18.27% of population are 65 or

TABLE XIII. DESCRIPTIVE STATISTICS OF DEPENDENT, INDEPENDENT AND CONTROL
VARIABLES

Variables	Obs	Mean	Std. Dev.	Min	Max
<i>Dependent Variables</i>					
1. Frequent mental distress (%)	1662	12.248	1.874	8.035	19.176
2. Sexually transmitted infections (per 100,000 population)	1623	359.871	207.077	55	1422.2
3. Teen births	1626	32.113	14.439	2.822	128.651
4. Adult smoking (%)	1662	17.871	3.483	6.735	31.737
<i>Independent Variables</i>					
1. Mental illness prevention (%) (asset specificity=4.17; service measurability=4.33)	336	18.006	34.922	0	100
2. Treatment for HIV/AIDS/Other STDs (%) (asset specificity=4.25; service measurability=3.00)	1268	10.016	25.311	0	100
3. Pregnancy prevention (%) (asset specificity=3.17; service measurability=3.83)	911	4.007	16.833	0	100
4. Tobacco prevention (%) (asset specificity=3.00; service measurability=3.17)	1314	6.012	19.853	0	100
<i>Control Variables</i>					
1. Some college (%)	1662	58.665	10.970	19.250	85.772
2. Unemployment (%)	1662	5.133	1.760	1.746	35.715
3. People over 65 (%)	1662	18.271	4.296	5.101	38.841
4. Non-Hispanic White (%)	1662	79.069	17.789	3.552	97.843
5. Log(population)	1662	4.638	0.636	2.840	7.006

TABLE XIV. OLS LINEAR REGRESSION RESULTS (STANDARDIZED BETA)

	Model 1 Frequent Mental Distress (%)	Model 2 Sexually Transmitted Infections (per 100,000 population)	Model 3 Teen Births (numbers)	Model 4 Adult Smoking (%)
Contracting high transaction cost service: Mental illness prevention	-0.042(0.002)			
Contracting mixed transaction cost service: Treatment for HIV/AIDS/STDs		-0.060** (0.172)		
Contracting mixed transaction cost service: pregnancy prevention			-0.066** (0.018)	
Contracting low transaction cost service: tobacco prevention				-0.071*** (0.003)
Some College	-0.620*** (0.009)	0.036(0.592)	-0.540*** (0.050)	-0.613*** (0.012)
Unemployed	0.223** (0.074)	0.011(5.570)	0.258*** (0.529)	0.163** (0.115)
People over 65	0.020(0.020)	-0.159*** (1.070)	-0.158*** (0.093)	-0.221*** (0.023)
Non-Hispanic White	-0.040(0.006)	-0.642*** (0.398)	-0.136*** (0.028)	0.188*** (0.006)
Log (Population)	0.143* (0.062)	-0.028(4.456)	-0.147*** (0.338)	-0.058(0.0789)
Cons	.(1.236)	.(84.180)	.(6.397)	.(1.460)
N	336	1254	904	1314
R ²	0.542	0.508	0.554	0.472

* p < 0.05; ** p < 0.01; *** p < 0.001

Note: Robust standard errors are reported in parentheses

older; 79.07% of population are non-Hispanic white; and the average unemployment rate is 5.13%.

Table XIV exhibits the OLS analysis results of model 1 to model 4, which explore the relationship between outsourcing and health outcomes. In model 1, the outcome variable is the percentage of frequent mental distress and the explanatory variable is outsourcing mental illness prevention with high transaction costs (high asset specificity and difficult service measurability). I argue that contracting out high transaction cost public health services leads to negative effectiveness. I find no relationship between outsourcing mental illness prevention and frequent mental distress. This suggests that outsourcing high transaction cost services cannot improve health outcomes and is thus inadvisable. The results in model 1 also confirm that a jurisdiction is more likely to have lower rates of frequent mental distress when the population is more highly educated, employed, and has a smaller population.

In terms of model 2 in table XIV, I estimate the influence of outsourcing treatment for HIV/AIDS/STDs on sexually transmitted infections per 100,000 population. The findings designate that contracting out mixed transaction cost services (high asset specificity and low service measurability) may improve health outcomes. Turning to model 3, in which the outcome variable is teen births and the primary explanatory variable is outsourcing pregnancy prevention services. I hypothesize that contracting out such services (low asset specificity and high service measurability) helps reduce teen births. I find as well negative relationship between outsourcing activities and teen births, in other words, contracting leads to improve health outcomes in this

case. In addition, findings with respect to control variables reveal that jurisdictions are more likely to have lower teen births when the county demographics include higher education and employment rates, and larger elderly and white populations.

Looking last at model 4, in which the outcome variable is percentage of adult smokers and the primary independent variables include population-based primary prevention of tobacco use. I hypothesize that outsourcing more tobacco prevention reduces the adult smoking rates. The findings are consistent with hypothesis 3. The results demonstrate that lower adult smoking rates are strongly correlated with outsourcing tobacco prevention activities. The results also indicate that jurisdictions are likely to have lower rates of smokers in adults with higher percentages of some college, employed, the elderly, or minority.

4.8 Discussion and Limitation

This study is among the first to elucidate the effects of outsourcing on local health outcomes by providing new insights about the relationship between collaborative arrangement and effectiveness. This research suggests that service characteristics can affect the outsourcing effectiveness and enhance service outcomes when contracting for public health. The findings indicate that contracting out health services with lower asset specificity and easier service measurability, or lower transaction costs, are more likely to reduce risks of contract failure and produce positive effectiveness. Moreover, services that are characterized by high transaction costs, such as those that are difficult to measure, and those that involve highly specific assets

are not good candidates for contracting out, as there are more likely to be implications for reduced service quality as a result. This study contributes to contracting literature by attaching importance to service characteristics and their impact on outcomes, as well as attempting to unravel a problem: why empirical research on contracting outcomes has presented mixed results? Identifying and analyzing service characteristics of asset specificity and ease of measurability may advance our understanding of the correlation between collaboration and effectiveness.

Second, the results also designate that outsourcing may outperform in-house delivery for certain health outcomes: frequent mental distress, STI rates, teen births, and adult smoking rates. Previous studies have examined cost savings and efficiency with fewer examined service quality and program performance. The findings indicate that the make-or-buy decision may shape the changes in local health outcomes. Future research should further examine how contracting influences outcomes in regard to other public services. Moreover, additional specific health outcomes worth exploration.

Third, resource dependence theory may be a useful lens through which to examine the impact of collaboration on service quality. Resource dependence theory suggests that organizations may gain more resources through collaboration in order to improve the effectiveness of public service delivery. The results in this study indicate that acquired resources of certain health services may help LHDs to improve effectiveness and outcomes. Further

research might apply this theory to other types of collaboration such as networks, alliances, coalitions, and so forth.

Fourth, this study has implications for practices in LHDs. Keane et al. (2001) conduct interviews with 347 local health department directors and reveal their thoughts in regards with service privatization because in most cases LHD senior administrators make the decision of privatizing out health services. Keane, Marx, and Ricci (2001; 2002) find that although many LHD directors agree that LHDs “should withdraw from the direct provision of services to focus on the core functions of assessment, assurance, and policy-making”, they also worry that “privatization would undermine departments’ control over services and functions, hindering their ability to respond to crises”. Furthermore, many directors state that certain services should not be privatized, such as personal health services, communicable disease services, environmental health services, and regulatory or enforcement functions (Keane, Marx, and Ricci 2002). From both the public administration and public health perspectives, this study offers evidence-based suggestions for public health agency leaders. The findings can be helpful for their make-or-buy decision facing expanded needs and reduced resources. This study suggests that: (1) public agencies can maintain the autonomy and power through contracting activities; (2) contracting out lower transaction cost services can improve health outcomes (especially in terms of four specific health issues); and (3) LHD leaders could make the future decision of in-house delivery or contracting based on analysis of the health outcomes in previous practices.

While this study provides suggestions and implications for scholars and practitioners in understanding how collaboration affects effectiveness, several limitations of the data and analysis must be acknowledged. First, the data limitation does not allow for making a causal inference for the link between contracting out all types of public health services and corresponding health outcomes. This study covers only several specific types of health services. However, I also see this as a major opportunity for future research. To better establish this causal link, interviews or surveys could be conducted with pointed questions on the issue of contracting effectiveness. Second, the NACCHO survey did not ask further questions regarding who are the contractors in collaborative arrangements. Andrews and Entwistle (2010) indicate that the sectoral choice that organizations make will influence the effectiveness of public agencies' efforts to address social issues. Specifically, "public-public partnership is positively associated with effectiveness, efficiency, and equity, but public-private partnership is negatively associated with effectiveness and equity, while public-nonprofit partnership is unrelated to performance" (679). Without knowing the sectoral choice by local health departments, it is hard to have clear understanding of the impact of cross-sectoral partnerships. The NACCHO could include these questions in future surveys in order to provide specific contractor information, therefore we could better understand the potentially different roles of for-profit firms, nonprofit organizations and other government agencies in contracting services. Third, the data limitations prevent this study from examining the relationship in a longitudinal analysis. The CHRR data indicate that some health measures should not be compared with prior years due to the changes in the methods for calculating the measures such as fair or poor health and adult

smoking rates. Despite these limitations, this study moves one step further in understanding how public sector collaboration with outside providers creates value for the public, and more importantly, how contracting improves health outcomes in local communities.

5. SUMMARY AND DISCUSSION

5.1 Overview of Findings

This dissertation sought to advance understanding of determinants and outcomes of contracting out local health services by analyzing a set of inter-related questions: (1) Why would local public health agencies choose the alternative of outsourcing rather than in-house delivery? (2) What factors influence the buy-or-not-buy option? (3) What factors account for the buy-more-or-less alternative? (4) What service characteristic affect the make-or-buy decision? (5) How do the contracting activities affect local health outcomes at the community level?

I set out to address these questions through a multi-method study of relationship between influential factors and the make-or-buy decision, as well as correlation between outsourcing activities and specific health issues. This study dives into local health departments, identifies unique features of public health services, and gains some inspiring findings at the agency, service, and community levels. As figure 9 manifests based on the findings in previous chapters, multiple factors including local health departments' institutional environment, management, the existence of nonprofits in the area, and transaction cost service characteristics can influence LHD directors' choice of alternative delivery modes. And the contracting out activities, generated from the make-or-buy decisions, can further affect health outcomes in local communities.

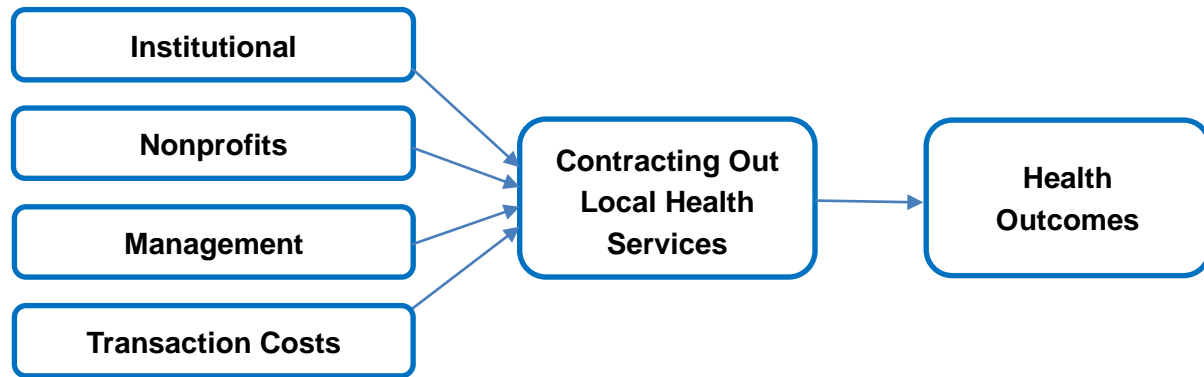


Figure 7. Determinants and outcomes of contracting out local health services

5.1.1 Determinants of Contracting Out Decision

The findings in chapter 2&3, as laid out in figure 10, indicate the factors that can influence the decision to contract out local health services. At the department/agency level, chapter 2 explores the environmental, nonprofits, and management determinants of the outsourcing decision through two-factor model. The results present two-stage decision making: outsourcing or not and outsourcing more or less. The findings depict specifically the decision-making process by LHD directors in two steps:

- (1) The first step, or the make-or-buy decision, is influenced by institutional and fiscal pressures and management factors.
- (2) The second step, or the buy-more-or-less decision, is affected by political pressure and the density of nonprofits.

Put it another way, those factors play different roles in the decision-making process in LHDs. It seems that the endeavor to contract out at least one service is motivated by the director's willingness to accept the innovation, consideration of the insufficient workforce, and learning from peer agencies. Once the director has decided to implement contracting policy in service delivery, s/he would think more about the most likely recipients and the most ideal contractors. Thus, chapter 2 points to the importance of understanding the contracting decision under two connected circumstances.

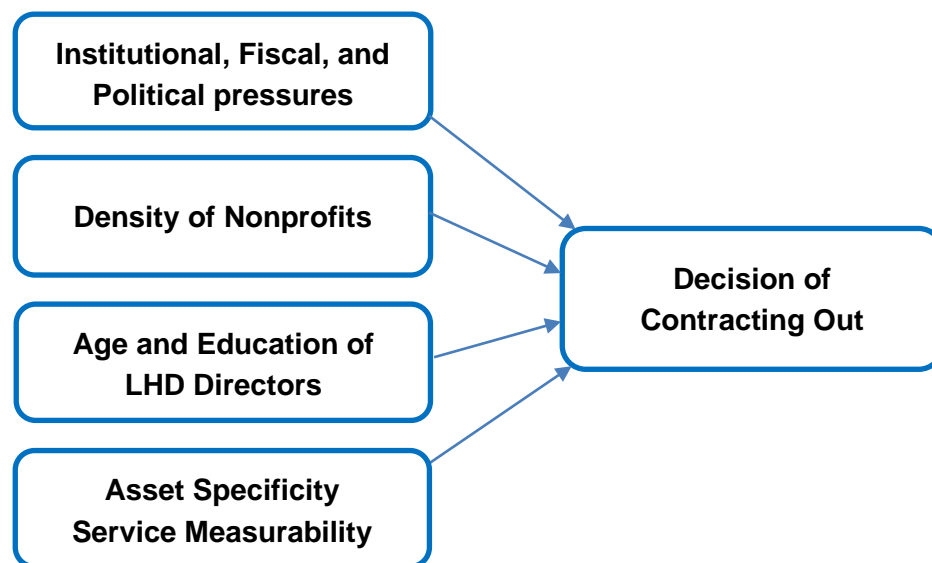


Figure 8. Determinants of decision to contract out local health services

At the service level, chapter 3 examines how two transaction cost dimensions, asset specificity and service measurability, impact the outsourcing decision. The results indicate that local health departments increase in-house production when asset specificity and service

measurability move from low to moderate levels, and then reduce complete internal production when transaction costs reach very high levels. The most significant unfolded fact is that public health services on average have almost the highest transaction costs among public services. For public health services, another confirmation is that ease of measurability aligns with asset specificity and plays a similar role as does the latter. Thus, this study contributes to the public administration literature that lacks consideration of the mechanism of transaction cost in the context of public health.

5.1.2 Outcomes of Contracting Out Activities

Chapter 4 investigates the health outcomes of contracting activities among local health departments (LHDs) and fills the gap in literature that has yet to explore the correlation between service quality and outsourcing in public health agencies. This analysis identifies four health issues and connects the outsourcing with the improvement in service quality. The findings, as figure 11 displays, suggest that service characteristics contribute to enhanced service outcomes when contracting for public health. Clearly speaking, contracting out health services with lower asset specificity and easier service measurability, or lower transaction costs, are more likely to generate better health outcomes.

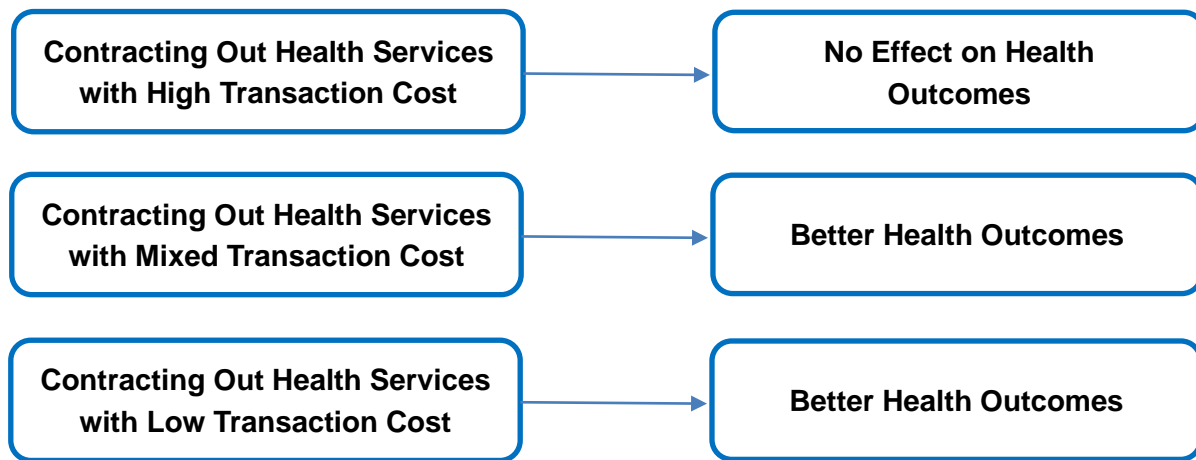


Figure 9. Outcomes of contracting out local health services

5.2 Implications for Contracting Policy

The study of contracting out or outsourcing is important because it has both theoretical and practical implications for local health departments. The arguments in three essays were built on several theories and frameworks including institutional framework, contract failure theory, transaction cost approach (for analyzing outsourcing factors), market failure theory, government failure theory, public choice theory, collaborative management framework, resource dependence theory, as well as an extended transaction cost framework (for analyzing outsourcing outcomes). The findings in three essays also provide some suggestions that can be applied to actual outsourcing practices in local health departments.

5.2.1 Theoretical Implications

Institutional environment sets up the rules of game for LHD directors when they are considering adoption of outsourcing. Their decisions are structured by those humanly devised fundamental institutional, fiscal, and political constraints. This study suggests understanding the constraints in two stages: first agency level and then community level. The two-factor model analysis results indicate that the decision by public health managers would at first be formed by agency management constraints: directors' personal background, whether a LHD has enough employees, and what they learn from peer public health agencies. Their initial motivation is not, however, from the composition of service providers and recipients in the community where an LHD serves for the public. Instead, mimetic isomorphism and compensation for insufficient human capacity crucially construct the make-or-buy decision.

This dissertation emphasizes the key role of health and human service nonprofit organizations in LHDs' outsourcing decision. The inherent merits of pursuing public values rather than monetary surplus shape the preference choice for nonprofits as ideal contractors to delivery public health services, which is underpinned by the rationales in foundational contract, market, and government failure theories. One finding that may contribute to literature points to the density of nonprofits affecting LHDs' option in terms of increasing government -funded health services to those vulnerable groups such as low-income and certain minority population.

Throughout this dissertation, transaction cost framework lubricates understanding of rationales in both outsourcing decisions and outcomes. This study took efforts to survey public health experts and obtain ratings of asset specificity and service measurability for many public health services, which is yet to be attempted by prior research. Based on the valuable data of service transaction cost, I was able to evaluate the contribution of transaction cost and perceive its different explanation in health service delivery. From the decision-making aspect, LHDs would not internalize producing services when both asset specificity and service measurability are very high, but leave it for private market. However, LHDs would take responsibility for those low-income people who can't afford high market prices by funding nonprofits to deliver high transaction cost services. It seems that LHDs view nonprofits as more economically efficient alternative than direct delivery. More importantly, such publicly funded production mode can meet the service needs, or at least partly, by the vulnerable people for free or with lower prices. From the outcome aspect, outsourcing performs better than expected. Even contracting out high transaction cost health services may not lead to harmful health outcomes. Contracting out low transaction cost will the most likely result in improved health outcomes.

5.2.2 Empirical Implications

This dissertation intends to build a bridge between research and empirical applications of outsourcing to daily practices in local health departments. The first suggestion would be: Do not be too cautious toward the contracting out option. Otherwise speaking, as noted earlier, even contracting out high transaction cost health services may not be linked to harmful health

outcomes. While this study examines only four health issues and does not draw the conclusion from many more services, the findings are still meaningful. Particularly, if an LHD director is considering contracting out any of those four health services covered in this study, s/he should set out to reach the goals of improved outcomes on STD treatment, pregnancy prevention, and tobacco prevention. Depending on the success of contracting out those services, s/he should scale up from there.

Second, LHDs should evaluate their make-or-buy decisions based on not only agency environment but also service characteristics. Not peer agencies and director's age and education, but transaction costs of services and local residents' socioeconomic status and demographic characteristics could determine the ultimate goal for LHDs: the health and well-being of humans. One further recommendation for LHDs is that they should track the health outcomes over time and make the evidence-based outsourcing decision accordingly.

Last, but not least, the results of this study suggest that nonprofits are responsible, dependable, and trustworthy vendors as well as partners in producing and delivering public health services to save costs and improve quality. Even when they are not publicly funded and running the service independently, it appears that they would endure the very high transaction cost and insist to provide those services within low-income population densely areas. This study suggests LHD directors to consider nonprofits as advantageous choice when making the outsourcing policy.

5.3 **Conclusion and Directions for Future Research**

As the findings throughout this dissertation suggest, multiple theories prescribe important roles of institutional, nonprofit, management, and transaction cost factors in predicting the make-or-buy decision in LHDs. This study provides empirical evidence that outsourcing indeed improves public health quality. It also shows the powerful explanation of transaction cost framework in understanding both the determinants and outcomes of contracting out local health services.

The findings from this dissertation can help to shape what we know about outsourcing in the public sector and advance the practices in public health agencies. These findings from three essays have both theoretical and practical implications. Taken together, this dissertation suggests several directions for future research related to contracting out public services.

What are other motives of LHD directors for outsourcing? What role of their individual political incentives play in likelihood of buy rather than make, and make more rather than less? Much attention has been given to local residents and service recipients, not to public health managers who play a crucial role in the decision-making process. A range of political incentives may influence their choice. There is a particular need to examine the role of public health managers and their interactions with the larger political environment, and future studies should place a premium on including a set of factors related to political incentives.

Does contracting improve outcomes of all public health services? This study examines only four health issues, thus it should be cautious to conclude that contracting can certainly improve health outcomes. Future studies might improve our recognition at this relationship more directly. For example, qualitative research through interviews with LHD staff asking them their impressions of the effectiveness of contracting and its impact on local health outcomes would be a very good direction for future research.

Are public health staff or professionals (not directors) in LHDs truly inclined toward outsourcing more services? If so, is it because they are guided by a public-serving ethic and professional values that favor outsourcing? Future studies should survey and employ data from those staff in LHDs in order to better understand the impact of their role in the make-or-buy and make-more-or-less decisions.

This study used available data to measure and explore the role of fiscal pressure in the decision. The results do not support its role partly due to lack of data to build a better measurement. Future studies should collect more detailed data and operationalize an ideal measure to investigate whether budget affects the choice.

Does outsourcing produce cost-savings? Do nonprofit contractors, if any, improve health outcomes on specific health issues? Are citizens/consumers/voters satisfied with public health services they receive through outsourcing? What is the value added by outsourcing versus direct delivery? While this dissertation provides some evidence on outcomes of LHD

contracting, these questions remain largely unknown. These are important questions for future research because they have significant implications for the practice of contracting out local health services (LeRoux 2006, 226-234).

CITED LITERATURE

- AbouAssi, Khaldoun, Lewis Faulk, Long Tran, Lilli Shaffer, and Minjung Kim. 2019. "Use and Perceptions of the Availability of Local Government and Nonprofit Services in Diverse Urban Settings." *Nonprofit and Voluntary Sector Quarterly* 48 (5): 975-997.
- Abramovitz, Mimi. 1986. "The privatization of the welfare state: A review." *Social work* 31 (4): 257-264.
- Advisory Commission on Intergovernmental Relations, ACIR. 1987. *The Organization of Local Public Economies*. Advisory Commission on Intergovernmental Relations Washington, DC.
- Agbodzakey, James K. 2012. "Collaborative governance of HIV health services planning councils in Broward and Palm Beach counties of South Florida." *Public Organization Review* 12 (2): 107-126.
- Agranoff, Robert, and Michael McGuire. 2004. *Collaborative public management: New strategies for local governments*. Georgetown University Press.
- Alchian, Armen A., and Harold Demsetz. 1972. "Production, information costs, and economic organization." *The American Economic Review* 62 (5): 777-795.
- American Community Survey, ACS. 2015. "Income in the Past 12 Months (In 2015 Inflation-Adjusted Dollars)." Accessed March 15, 2020.
<https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkml>.
- American Public Health Association, APHA. 2019. "What is Public Health?". Accessed October 10, 2019. <https://www.apha.org/what-is-public-health>.
- Amirkhanyan, Anna A. 2007. "The smart-seller challenge: Exploring the determinants of privatizing public nursing homes." *Journal of Public Administration Research and Theory* 17 (3): 501-527.
- . 2008. "Collaborative performance measurement: Examining and explaining the prevalence of collaboration in state and local government contracts." *Journal of Public Administration Research and Theory* 19 (3): 523-554.
- Andrews, Rhys, and Tom Entwistle. 2010. "Does cross-sectoral partnership deliver? An empirical exploration of public service effectiveness, efficiency, and equity." *Journal of Public Administration Research and Theory* 20 (3): 679-701.

- Anheier, Helmut K. 1995. "Theories of the nonprofit sector: three issues." *Nonprofit and Voluntary Sector Quarterly* 24 (1): 15-23.
- Ansell, Chris, and Alison Gash. 2008. "Collaborative governance in theory and practice." *Journal of Public Administration Research and Theory* 18 (4): 543-571.
- Ascher, Kate. 1987. *The Politics of Privatisation: Contracting Out Public Services*. Macmillan Education.
- Auger, Deborah A. 1999. "Privatization, contracting, and the states: Lessons from state government experience." *Public Productivity & Management Review* 22 (4): 435-454.
- Averch, Harvey. 1990. *Private Markets and Public Intervention: A Primer for Policy Designers*. University of Pittsburgh Press.
- Avery, George. 2000. "Outsourcing public health laboratory services: A blueprint for determining whether to privatize and how." *Public Administration Review* 60 (4): 330-337.
- Bantel, Karen A., and Susan E. Jackson. 1989. "Top management and innovations in banking: Does the composition of the top team make a difference?" *Strategic Management Journal* 10 (7): 107-124.
- Behn, Robert D., and Peter A. Kant. 1999. "Strategies for avoiding the pitfalls of performance contracting." *Public Productivity & Management Review* 22(4): 470-489.
- Bel, Germà, Xavier Fageda, and Mildred E. Warner. 2010. "Is private production of public services cheaper than public production? A meta-regression analysis of solid waste and water services." *Journal of Policy Analysis and Management* 29 (3): 553-577.
- Ben-Ner, Avner, and Theresa Van Hoomissen. 1991. "Nonprofit organizations in the mixed economy." *Annals of Public and Cooperative Economics* 62 (4): 519-550.
- Bennet, James, and M. Johnson. 1981. *Better Government at Half the Price: Private Production of Public Services*. Ottawa, Illinois: Caroline House Publishers.
- Benton, J. Edwin, and Donald C. Menzel. 1992. "Contracting and franchising county services in Florida." *Urban Affairs Quarterly* 27 (3): 436-456.
- Botkin, William E. 1999. "Role of public/private juvenile programs." In *Contracting Out Government Services*, edited by Paul Seidenstat, 93-107. Westport, CT: Praeger.
- Boyne, George A. 1998a. "Bureaucratic theory meets reality: Public choice and service contracting in U.S. local government." *Public Administration Review* 58 (6): 474-484.

- . 1998b. "The determinants of variations in local service contracting: Garbage in, garbage out?" *Urban Affairs Review* 34 (1): 150-163.
- . 1998c. *Public Choice Theory and Local Government*. London: Macmillan Press.
- Breul, Jonathan D. 2010. "Practitioner's perspective—Improving sourcing decisions." *Public Administration Review* 70: s193-s200.
- Brown, Eleanor, and Al Slivinski. 2006. "Nonprofit organizations and the market." In *The Nonprofit Sector: A Research Handbook*, edited by W. Powell and R. Steinberg, 140-158. New Haven, CT: Yale University Press.
- Brown, Trevor L. 2013. *A Guide for Agency Leaders on Federal Acquisition: Major Challenges Facing Government*. The IBM Center.
- Brown, Trevor L., and Matthew Potoski. 2003a. "Contract-management capacity in municipal and county governments." *Public Administration Review* 63 (2): 153-164.
- . 2003b. "Transaction costs and institutional explanations for government service production decisions." *Journal of Public Administration Research and Theory* 13 (4): 441-468.
- . 2004. "Managing the public service market." *Public Administration Review* 64 (6): 656-668.
- . 2005. "Transaction costs and contracting: The practitioner perspective." *Public Performance & Management Review* 28 (3): 326-351.
- Brown, Trevor L., Matthew Potoski, and David M. Van Slyke. 2006. "Managing public service contracts: Aligning values, institutions, and markets." *Public Administration Review* 66 (3): 323-331.
- . 2015. "The impact of transaction costs on the use of mixed service delivery by local governments." *Journal of Strategic Contracting and Negotiation* 1 (4): 239-267.
- . 2016. "Managing complex contracts: A theoretical approach." *Journal of Public Administration Research and Theory* 26 (2): 294-308.
- . 2018. "Complex contracting: Management challenges and solutions." *Public Administration Review* 78 (5): 739-747.
- Brudney, Jeffrey L., Sergio Fernandez, Jay Eungha Ryu, and Deil S. Wright. 2005. "Exploring and explaining contracting out: Patterns among the American states." *Journal of Public Administration Research and Theory* 15 (3): 393-419.

- Brunton, Margaret Ann, and Christopher James Galloway. 2016. "The role of "organic public relations" in communicating wicked public health issues." *Journal of Communication Management* 20 (2): 162-177.
- Buchanan, James M., and Gordon Tullock. 1962. *The Calculus of Consent*. Vol. 3. University of Michigan Press.
- Carr, Jered B., Kelly LeRoux, and Manoj Shrestha. 2009. "Institutional ties, Transaction costs, and external service production." *Urban Affairs Review* 44 (3): 403-427.
- Carroll, James D. 1987. "Public administration in the third century of the constitution: supply-side management, privatization, or public investment?" *Public Administration Review* 47(1): 106-114.
- Centers for Disease Control and Prevention, CDC. 2013. "Public Health Financing." Accessed October 1, 2019. https://www.cdc.gov/publichealthgateway/docs/finance/Public_Health_Financing-6-17-13.pdf.
- Chandler, Timothy D., and Peter Feuille. 1994. "Cities, unions, and the privatization of sanitation services." *Journal of Labor Research* 15 (1): 53-71.
- Churchman, C. West. 1967. "Guest Editorial: Wicked Problems." *Management Science* 14 (4): B141-B142.
- Coase, Ronald H. 1937. "The nature of the firm." *Economica* 4 (16): 386-405.
- Cohen, Steven. 2001. "A strategic framework for devolving responsibility and functions from government to the private sector." *Public Administration Review* 61 (4): 432-440.
- County Health Rankings & Roadmaps, CHRR. 2018. "County Health Rankings & Roadmaps: About Us." Accessed May 10, 2019. <https://www.countyhealthrankings.org/about-us>.
- Damanpour, Fariborz, and Marguerite Schneider. 2006. "Phases of the adoption of innovation in organizations: Effects of environment, organization and top managers." *British Journal of Management* 17 (3): 215-236.
- . 2009. "Characteristics of innovation and innovation adoption in public organizations: Assessing the role of managers." *Journal of Public Administration Research and Theory* 19 (3): 495-522.

- Davis, Forrest W., Willy D. Smith, B. Hewa, and Dennis Donahue. September, 1989. "Development of A Public Service Providing Strategy: Agency Provided VS. Privatization; Single Provided VS. Strategic Network. Final Report." International Transport Forum, Washington, DC.
- Davis, Lance E., and Douglass C. North. 1971. *Institutional Change and American Economic Growth*. Cambridge University Press.
- Deb, Partha, and Edward C. Norton. 2018. "Modeling health care expenditures and use." *Annual Review of Public Health* 39 (1): 489-505.
- DeHoog, Ruth Hoogland. 1984. *Contracting Out for Human Services: Economic, Political, and Organizational Perspectives*. State University of New York Press.
- DeHoog, Ruth Hoogland, and Lana Stein. 1999. "Municipal contracting in the 1980s: Tinkering or reinventing government." In *Contracting Out Government Services*, edited by Paul Seidenstat, 26-38. Westport, CT: Praeger.
- Dickinson, Helen, and Jon Glasby. 2010. "'Why partnership working doesn't work': Pitfalls, problems and possibilities in English health and social care." *Public Management Review* 12 (6): 811-828.
- Dilger, Robert Jay, Randolph R. Moffett, and Linda Struyk. 1997. "Privatization of municipal services in America's largest population cities." *Public Administration Review* 57 (1): 21-26.
- Dixit, Avinash K. 1998. *The Making of Economic policy: A Transaction-Cost Politics Perspective*. The MIT press.
- Douglas, James. 1983. *Why Charity?*. CA: Sage: Beverly Hills.
- Downs, Anthony. 1967. *Inside Bureaucracy*. Harper Collins.
- Duan, Naihua, Willard G. Manning, Carl N. Morris, and Joseph P. Newhouse. 1983. "A comparison of alternative models for the demand for medical care." *Journal of Business & Economic Statistics* 1 (2): 115-126.
- Duggan, Mark. 2004. "Does contracting out increase the efficiency of government programs? Evidence from Medicaid HMOs." *Journal of Public Economics* 88 (12): 2549-2572.
- Easley, David, and Maureen O'Hara. 1983. "The economic role of the nonprofit firm." *The Bell Journal of Economics* 14(2): 531-538.

- Feiock, Richard C. 2009. "Metropolitan governance and institutional collective action." *Urban Affairs Review* 44 (3): 356-377.
- . 2013. "The institutional collective action framework." *Policy Studies Journal* 41 (3): 397-425.
- Feiock, Richard C., and Hee Soun Jang. 2009. "Nonprofits as local government service contractors." *Public Administration Review* 69 (4): 668-680.
- Feiock, Richard C., and John T. Scholz. 2010. "Self-organizing governance of institutional collective action dilemmas: An overview." In *Self-Organizing federalism: Collaborative Mechanisms to Mitigate Institutional Collective Action Dilemmas*, edited by Richard C. Feiock and John T. Scholz, 3-32. New York, NY: Cambridge University Press.
- Fernandez, Sergio, Jay Eungha Ryu, and Jeffrey L. Brudney. 2008. "Exploring variations in contracting for services among American local governments: Do politics still matter?" *The American Review of Public Administration* 38 (4): 439-462.
- Ferris, James. 1986. "The Decision to contract out: An empirical analysis." *Urban Affairs Review* 22 (2): 289-311.
- Ferris, James, and Elizabeth Graddy. 1986. "Contracting out: For what? With whom?" *Public Administration Review* 46(4): 332-344.
- Ferris, James M., and Elizabeth Graddy. 1991. "Production costs, transaction costs, and local government contractor choice." *Economic Inquiry* 29 (3): 541-554.
- Fisk, Donald M., Herbert J. Kiesling, and Thomas Muller. 1978. *Private Provision of Public Services: An Overview*. Urban Institute.
- Fredericksen, Patricia, and Rosanne London. 2000. "Disconnect in the hollow state: The pivotal role of organizational capacity in community-based development organizations." *Public Administration Review* 60 (3): 230-239.
- Friedländer, Walter A. 1955. *Introduction to Social Welfare*. New York, NY: Prentice-Hall.
- Gazley, Beth, and Jeffrey L. Brudney. 2007. "The purpose (and perils) of government-nonprofit partnership." *Nonprofit and Voluntary Sector Quarterly* 36 (3): 389-415.
- Giovannoni, Jeanne M. 1982. *Perspectives on the Purchase of Services from the Public and Private Sectors*. School of Social Welfare, University of California.
- Gollust, Sarah E., and Peter D. Jacobson. 2006. "Privatization of public services: Organizational reform efforts in public education and public health." *American Journal of Public Health* 96 (10): 1733-1739.

- Green, Emma, Julie Nelson Ingoglia, and Cindy Phillips. 2004. "Share what works: model practices in local public health agencies." *Journal of Public Health Management and Practice* 10 (2): 180-182.
- Greene, Jeffrey D. 2002. *Cities and Privatization: Prospects for The New Century*. Upper Saddle River, NJ: Pearson College Div.
- Hall, Richard. 2000. "Outsourcing, contracting-out and labour hire: implications for human resource development in Australian organizations." *Asia Pacific Journal of Human Resources* 38 (2): 23-41.
- Hansmann, Henry B. 1980. "The role of nonprofit enterprise." *The Yale Law Journal* 89 (5): 835-901.
- . 1987. "Economic theories of nonprofit organizations." In *The Nonprofit Sector: Research Handbook*, edited by Walter W. Powell, 27-42. New Haven: Yale University Press.
- Hart, Oliver, and John Moore. 1999. *On the Design of Hierarchies Coordination Versus Specialization*. In *NBER working paper series No.w7388*. Cambridge, MA: National Bureau of Economic Research,.
- Hefetz, Amir, and Mildred Warner. 2004. "Privatization and its reverse: Explaining the dynamics of the government contracting process." *Journal of Public Administration Research and Theory* 14 (2): 171-190.
- . 2011. "Contracting or public delivery? The importance of service, market, and management characteristics." *Journal of Public Administration Research and Theory* 22 (2): 289-317.
- Hernandez, Lyla M, Linda Rosenstock, and Kristine Gebbie. 2003. *Who Will Keep the Public Healthy: Educating Public Health Professionals for the 21st Century*. National Academies Press.
- Hirsch, Werner Z. 1991. *Privatizing Government Services: An Economic Analysis of Contracting Out by Local Governments*. Vol. 54. Los Angeles, CA: Institute of Industrial Relations, University of California, Los Angeles.
- . 1995. "Contracting out by urban governments: A review." *Urban Affairs Review* 30 (3): 458-472.
- Hodge, Graeme A. 2000. *Privatization: An International Review of Performance. Theoretical lenses on public policy*. Boulder, CO: Westview Press.

- . 2018. *Privatization: An International Review of Performance*. Routledge.
- Huber, George P., Kathleen M. Sutcliffe, C. Chet Miller, and William M. Glick. 1993. "Understanding and predicting organizational change." In *Organizational Change and Redesign*, edited by G. P. Huber and W. H. Glick. New York: Oxford Univ. Press.
- Ingoglia, Julie Nelson. 2004. "Making strategic decisions about service delivery." *Journal of Public Health Management and Practice* 10 (3): 272-274.
- Institute of Medicine, IOM 1988. *The Future of Public Health*. Washington, D.C.: National Academy Press.
- . 2003. *The Future of the Public's Health in the 21st Century*. National Academies Press.
- Issel, L Michele, Comfort Olorunsaiye, Laura Snebold, and Arden Handler. 2015. "Relationships among providing maternal, child, and adolescent health services; Implementing various financial strategy responses; and performance of local health departments." *American Journal of Public Health* 105 (S2): S244-S251.
- Johnston, Van R, and Paul Seidenstat. 2007. "Contracting out government services: Privatization at the millenium." *International Journal of Public Administration* 30 (3): 231-247.
- Jones, Jeffrey M. 2013. "Record high in US Say Big Government Greatest Threat." Accessed October 1, 2019. www.gallup.com/poll/166535/record-highsay-big-government-greatest-threat.aspx.
- Keane, Christopher, John Marx, and Edmund Ricci. 2002. "Services privatized in local health departments: a national survey of practices and perspectives." *American Journal of Public Health* 92 (8): 1250-1254.
- Kelleher, Christine A., and Susan Webb Yackee. 2009. "A Political consequence of contracting: Organized interests and state agency decision making." *Journal of Public Administration Research and Theory* 19 (3): 579-602.
- Kettl, Donald F. 1993. "The myths, realities, and challenges of privatization." In *Revitalizing State and Local Public Service: Strengthening Performance, Accountability, and Citizen Confidence*, edited by Frank J. Thompson, 246-275. San Francisco: Jossey-Bass Publishers.
- . 2002. "Managing indirect government." In *The Tools of Government: A Guide to The New Governance*, edited by Lester M Salamon and Odus V. Elliott, 490-510. Oxford University Press.

- . 2011. *Sharing Power: Public Governance and Private Markets*. Washington, D.C: Brookings Institution Press.
- . 2015. "The job of government: Interweaving public functions and private hands." *Public Administration Review* 75 (2): 219-229.
- Kodrzycki, Yolanda K. 1994. "Privatization of local public services: Lessons for New England." *New England Economic Review* (May): 31-46.
- . 1998. "Fiscal pressures and the privatization of local services." *New England Economic Review* (Jan/Feb): 39-50.
- Koontz, Tomas M., and Craig W. Thomas. 2006. "What do we know and need to know about the environmental outcomes of collaborative management?" *Public Administration Review* 66 (s1): 111-121.
- Kraft, Michael E., and Bruce B. Clary. 1991. "Citizen participation and the NIMBY syndrome: Public response to radioactive waste disposal." *Western Political Quarterly* 44 (2): 299-328.
- Lecy, Jesse D., and M. Van Slyke David. 2013. "Nonprofit sector growth and density: Testing theories of government support." *Journal of Public Administration Research and Theory* 23 (1): 189-214.
- Lee, Soo-Hoon, Poh-Kam Wong, and Chee-Leong Chong. 2005. "Human and social capital explanations for R&D outcomes." *IEEE Transactions on Engineering Management* 52 (1): 59-68.
- LeRoux, Kelly. 2006. "The Role of Structure, Function, and Networks in Explaining Interlocal Service Delivery: A Study of Institutional Cooperation in Michigan." Dissertation, Wayne State University.
- . 2007. *Service Contracting: A Local Government Guide*. ICMA Press.
- . 2009. "Managing stakeholder demands: Balancing responsiveness to clients and funding agents in nonprofit social service organizations." *Administration & Society* 41 (2): 158-184.
- LeRoux, Kelly, and Mary K Feeney. 2014. *Nonprofit Organizations and Civil Society in the United States*. Routledge.
- Levine, Marvin J. 1990. *Privatization of Government: The Delivery of Public Goods and Services by Private Means*. International Personnel Management Association - United States.

- Lindsay, Cotton M. 1976. "A theory of government enterprise." *Journal of Political Economy* 84 (5): 1061-1077.
- Lowery, David. 1982. "The political incentives of government contracting." *Social Science Quarterly* 63 (3): 517.
- May, Peter J., and Søren C. Winter. 2007. "Collaborative service arrangements: Patterns, bases, and perceived consequences." *Public Management Review* 9 (4): 479-502.
- Mays, Glen P., Megan C. McHugh, Kyumin Shim, Natalie Perry, Dennis Lenaway, Paul K. Halverson, and Ramal Moonesinghe. 2006. "Institutional and economic determinants of public health system performance." *American Journal of Public Health* 96 (3): 523-531.
- McGuire, Michael. 2006. "Collaborative public management: Assessing what we know and how we know it." *Public Administration Review* 66 (s1): 33-43.
- McGuire, Robert A., Robert L. Ohsfeldt, and T. Norman Van Cott. 1987. "The determinants of the choice between public and private production of a publicly funded service: Abstract." *Public Choice (1986-1998)* 54 (3): 211-230.
- McKinley, William, and Mark A. Mone. 2003. "Micro and macro perspectives in organization theory: A tale of incommensurability." In *The Oxford Handbook of Organization Theory*, edited by Haridimos Tsoukas and Christian Knudsen. Oxford University Press.
- Meier, Kenneth J., and Laurence J. O'Toole. 2001. "Managerial strategies and behavior in networks: A model with evidence from US public education." *Journal of Public Administration Research and Theory* 11 (3): 271-294.
- Milward, H. Brinton, and Keith G. Provan. 2000. "Governing the hollow state." *Journal of Public Administration Research and Theory* 10 (2): 359-380.
- Milward, H. Brinton, Keith G. Provan, and Barbara A. Else. 1993. "What does the hollow state look like." In *Public Management: The State of The Art*, edited by Barry. Bozeman, 309-322. San Francisco, CA: Jossey-Bass.
- Min, Yongyi, and Alan Agresti. 2002. "Modeling nonnegative data with clumping at zero: A survey." *Journal of the Iranian Statistical Society* 1 (1): 7-33.
- Mitchell, George E., Rosemary O'Leary, and Catherine Gerard. 2015. "Collaboration and performance: Perspectives from public managers and NGO leaders." *Public Performance & Management Review* 38 (4): 684-716.
- Moe, Ronald C. 1987. "Exploring the limits of privatization." *Public Administration Review* 47 (6): 453-460.

- Moe, Ronald C., and Thomas H. Stanton. 1989. "Government-sponsored enterprises as federal instrumentalities: Reconciling private management with public accountability." *Public Administration Review* 49 (4): 321-329.
- Morgan, David R., and Michael W. Hirlinger. 1991. "Intergovernmental service contracts: A multivariate explanation." *Urban Affairs Review* 27 (1): 128-144.
- Morgan, David R., Michael W. Hirlinger, and Robert E. England. 1988. "The decision to contract out city services: A further explanation." *The Western Political Quarterly* 41 (2): 363-372.
- Mumford, Michael D. 2000. "Managing creative people: Strategies and tactics for innovation." *Human Resource Management Review* 10 (3): 313-351.
- National Association of County and City Health Officials, NACCHO. 2005. *National Profile of Local Health Departments*. National Association of County and City Health Officials.
- . 2017a. *2016 National Profile of Local Health Departments*. National Association of County and City Health Officials.
- . 2017b. "2017 Profile Report." National Association of County and City Health Officials. Accessed May 10, 2019. http://nacchoprofilestudy.org/wp-content/uploads/2017/10/ProfileReport_Aug2017_final.pdf.
- . 2018. "Our Work." Accessed October 10, 2018. <https://www.naccho.org/programs>.
- Ni, Anna Ya, and Stuart Bretschneider. 2007. "The decision to contract out: A study of contracting for e-government services in state governments." *Public Administration Review* 67 (3): 531-544.
- Niskanen, William A. 1968. "The peculiar economics of bureaucracy." *The American Economic Review* 58 (2): 293-305.
- . 1971. *Bureaucracy and Representative Government*. Chicago, IL: Aldine.
- North, Douglass C. 1991. "Institutions." *Journal of Economic Perspectives* 5 (1): 97-112.
- O'Toole, Laurence J. 1997. "Treating networks seriously: Practical and research-based agendas in public administration." *Public Administration Review* 57(1): 45-52.
- O'Toole, Laurence J., and Kenneth J. Meier. 2004. "Parkinson's Law and the New Public Management? Contracting determinants and service quality consequences in public education." *Public Administration Review* 64 (3): 297-307.

- O'Leary, Rosemary, and Lisa B. Bingham. 2009. *The Collaborative Public Manager: New Ideas for the Twenty-first Century*. Georgetown University Press.
- O'Leary, Rosemary, and Nidhi Vij. 2012. "Collaborative Public Management: Where Have We Been and Where Are We Going?" *The American Review of Public Administration* 42 (5): 507-522.
- Oakerson, Ronald J, and Roger B. Parks. 2011. "The study of local public economies: Multi-organizational, multi-level institutional analysis and development." *Policy Studies Journal* 39 (1): 147-167.
- Oakerson, Ronald J. 1999. *Governing Local Public Economies: Creating the Civic Metropolis*. Oakland, CA: Ics Press.
- Oakerson, Ronald J., and Roger B. Parks. 1989. "Local government constitutions: a different view of metropolitan governance." *The American Review of Public Administration* 19 (4): 279-294.
- Ostrom, Vincent, Charles M. Tiebout, and Robert Warren. 1961. "The organization of government in metropolitan areas: A theoretical inquiry." *American Political Science Review* 55 (4): 831-842.
- Pack, Janet Rothenberg. 1987. "Privatization of public-sector services in theory and practice." *Journal of Policy Analysis and Management* 6 (4): 523-540.
- Page, Stephen. 2004. "Measuring accountability for results in interagency collaboratives." *Public Administration Review* 64 (5): 591-606.
- Parks, Roger B., and Ronald J. Oakerson. 1989. "Metropolitan organization and governance: A local public economy approach." *Urban Affairs Quarterly* 25 (1): 18-29.
- . 2000. *Regionalism, Localism, and Metropolitan Governance: Suggestions from the Research Program on Local Public Economies*. Los Angeles, CA: Sage Publications
- Pascal, Anthony H. 1980. *User Charges, Contracting Out, and Privatization in An Era of Fiscal Retrenchment*. Rand Corporation.
- Pfeffer, Jeffrey, and Gerald R. Salancik. 1978. *The External Control of Organizations: A Resource Dependence Perspective*. Harper & Row.
- Potoski, Matthew. 2008. "State and local government procurement and the winter commission." *Public Administration Review* 68 (1): S58-S69.

- Preker, Alexander S., and April Harding. 2007. "Political economy of strategic purchasing." In *Public Ends, Private Means: Strategic Purchasing of Health Services*, edited by Alexander S. Preker, Xingzhu Liu, Edit V. Velenyi and Enis Baris, 13-52. Washington DC: The World Bank.
- Public Health Accreditation Board, PHAB. 2013. "Public Health Accreditation Board Standards & Measures." Accessed May 10, 2019. https://phaboard.org/wp-content/uploads/PHABSM_WEB_LR1-1.pdf.
- . 2019. "Public Health Accreditation Board's (PHAB's) National Accreditation Program." Accessed May 10, 2019. <https://phaboard.org/about/>.
- Purdy, Jill M. 2012. "A framework for assessing power in collaborative governance processes." *Public Administration Review* 72 (3): 409-417.
- Ran, Bing, and Huiting Qi. 2018. "Contingencies of power sharing in collaborative governance." *The American Review of Public Administration* 48 (8): 836-851.
- Reich, Michael R. 2002. *Public-Private Partnerships for Public Health*. Cambridge, MA: Harvard University Press.
- Rittel, Horst W. J., and Melvin M. Webber. 1973. "Dilemmas in a general theory of planning." *Policy Sciences* 4 (2): 155-169.
- Roberts, Nancy. 1997. "Public deliberation: An alternative approach to crafting policy and setting direction." *Public Administration Review* 57 (2): 124-132.
- . 2000. "Wicked problems and network approaches to resolution." *International Public Management Review* 1 (1): 1-19.
- . 2002. "Keeping public officials accountable through dialogue: Resolving the accountability paradox." *Public Administration Review* 62 (6): 658-669.
- Rohrer, James. 2004. "Performance contracting for public health: The potential and the implications." *Journal of Public Health Management and Practice* 10 (1): 23-25.
- Romzek, Barbara S., and Jocelyn M. Johnston. 2002. "Effective contract implementation and management: A preliminary model." *Journal of Public Administration Research and Theory* 12 (3): 423-453.
- . 2005. "State social services contracting: Exploring the determinants of effective contract accountability." *Public Administration Review* 65 (4): 436-449.

- Salamon, Lester M. 1987. "Of market failure, voluntary failure, and third-party government: Toward a theory of government-nonprofit relations in the modern welfare state." *Journal of Voluntary Action Research* 16 (1-2): 29-49.
- . 1995. *Partners in public service: Government-nonprofit relations in the modern welfare state*. Vol. 19. Baltimore, MD: Johns Hopkins University Press
- Salamon, Lester M., and Michael S. Lund. 1984. *The Reagan Presidency and the Governing of America*. Urban Institute Press.
- Savas, Emanuel S. 1982. *Privatizing the Public Sector: How to Shrink Government*. Chatham House Publishers.
- . 1987. *Privatization: The Key to Better Government*. Chatham, NJ: Chatham House Publishers.
- . 2000. *Privatization and Public-Private Partnerships*. New York: Chatham House.
- Schmid, Hillel. 2003. "Rethinking the policy of contracting out social services to non-governmental organizations: Lessons and dilemmas." *Public Management Review* 5 (3): 307-323.
- Sclar, Elliott. 2000. *You Don't Always Get What You Pay For: The Economics of Privatization*. Ithaca: Cornell University Press.
- Scott, W. Richard, and Gerald F. Davis. 2007. *Organizations and Organizing: Rational, Natural, and Open System Perspectives*. Pearson Prentice Hall.
- Seidenstat, Paul. 1999. *Contracting Out Government Services*. Westport, CN: Praeger.
- Selden, Sally Coleman, Jessica E Sowa, and Jodi Sandfort. 2006. "The impact of nonprofit collaboration in early child care and education on management and program outcomes." *Public Administration Review* 66 (3): 412-425.
- Serra, George. 1995. "Citizen-Initiated Contact and Satisfaction with Bureaucracy: A Multivariate Analysis." *Journal of Public Administration Research and Theory* 5 (2): 175-188.
- Silvia, Chris. 2018. "Evaluating collaboration: The solution to one problem often causes another." *Public Administration Review* 78 (3): 472-478.
- Simon, Herbert A. 1957. *Models of Man, Social and National*. Wiley.
- . 1978. "Rationality as process and as product of thought." *The American Economic Review* 68 (2): 1-16.

- Sinclair, Amber, and Andrew Whitford. 2015. "Effects of participation and collaboration on perceived effectiveness of core public health functions." *American Journal of Public Health* 105 (8): 1638-1645.
- Smith, Steven Rathgeb, and Kirsten A Grønbjerg. 2006. "Scope and theory of government-nonprofit relations." In *The Nonprofit Sector: A Research Handbook*, edited by Walter W Powell and Richard Steinberg, 221-242. New Haven: Yale University Press.
- Sousa, David J., and Christopher McGrory Klyza. 2007. "New directions in environmental policy making: An emerging collaborative regime or reinventing interest group liberalism." *Natural Resources Journal* 47 (2): 377-444.
- Steinberg, Richard. 2006. "Economic theories of nonprofit organizations." In *The Study of the Nonprofit Enterprise* edited by Helmut K. Anheier and Avner Ben-Ner, 277-309. New York, NY: Springer.
- Steiner, Peter O. 1969. *Public Expenditure Budgeting*. Washington: Brookings Institution.
- Stigler, George J. 1971. "The theory of economic regulation." *The Bell Journal of Economics and Management Science* 2 (1): 3-21.
- Sullivan, Harold J. 1987. "Privatization of public services: A growing threat to constitutional rights." *Public Administration Review* 47(6): 461-467.
- Surpin, Jo., and Geri. Weidman. 1999. *Outsourcing in Health Care: The Administrator's Guide*. Wiley.
- Teitelbaum, Joel Bern, and Sara E. Wilensky. 2013. *Essentials of Health Policy and Law*. Jones & Bartlett Learning.
- Thompson, Lyke, and Richard C. Elling. 2000. "Mapping patterns of support for privatization in the mass public: The case of michigan." *Public Administration Review* 60 (4): 338-348.
- Tullock, Gordon. 1965. *The Politics of Bureaucracy*. Public Affairs Press.
- U.S. Government Accountability Office, U.S.GAO. 1997. *Privatization, Lessons Learned by State and Local Governments: Report to the Chairman, House Republican Task Force on Privatization*. United States General Accounting Office.
- . 2019. "Watch Blog Following the Federal Dollar." Accessed October 28, 2019. <https://blog.gao.gov/2019/05/28/federal-government-contracting-for-fiscal-year-2018-infographic/>.

University of California Los Angeles, UCLA. 2019. "Tobit Regression | Stata Annotated Output." Accessed May 10, 2019. <https://stats.idre.ucla.edu/stata/output/tobit-regression/>.

USASpending. 2019. "USA Spending 2018." Accessed October 28, 2019. <https://www.usaspending.gov/#/>.

Van Slyke, David M. 2002. "The public management challenges of contracting with nonprofits for social services." *International Journal of Public Administration* 25 (4): 489-517.

---. 2003. "The mythology of privatization in contracting for social services." *Public Administration Review* 63 (3): 296-315.

Van Slyke, David M., and Charles A. Hammonds. 2003. "The privatization decision: Do public managers make a difference?" *The American Review of Public Administration* 33 (2): 146-163.

Varda, Danielle, Jo Ann Shoup, and Sara Miller. 2012. "A systematic review of collaboration and network research in the public affairs literature: implications for public health practice and research." *American Journal of Public Health* 102 (3): 564-571.

Vining, Aidan R., and Steven Globerman. 1999. "Contracting-out health care services: a conceptual framework." *Health Policy* 46 (2): 77-96.

Warner, Mildred E., and Amir Hefetz. 2008. "Managing markets for public service: The role of mixed public-private delivery of city services." *Public Administration Review* 68 (1): 155-166.

---. 2012. "Insourcing and outsourcing: The dynamics of privatization among US municipalities 2002–2007." *Journal of the American Planning Association* 78 (3): 313-327.

Warner, Mildred, and Robert Hebdon. 2001. "Local government restructuring: Privatization and its alternatives." *Journal of Policy Analysis and Management* 20 (2): 315-336.

Weber, Edward P., and Anne M. Khademian. 2008a. "Managing Collaborative Processes: Common Practices, Uncommon Circumstances." *Administration & Society* 40 (5): 431-464.

---. 2008b. "Wicked problems, knowledge challenges, and collaborative capacity builders in network settings." *Public Administration Review* 68 (2): 334-349.

Weisbrod, Burton A. 1975. "Toward a theory of the voluntary nonprofit sector in a three-sector economy." In *Altruism, Morality, and Economics Theory*, edited by Edmund S. Phelps, 171-195. New York: Russell Sage Foundation.

---. 1991. *The Nonprofit Economy*. Cambridge: Harvard University Press.

Williamson, Oliver E. 1971. "The Vertical integration of production: Market failure considerations." *The American Economic Review* 61 (2): 112-123.

---. 1975. *Markets and Hierarchies: Analysis and Antitrust Implications: A Study in the Economics of Internal Organization*. Free Press.

---. 1979. "Transaction-cost economics: The governance of contractual relations." *The Journal of Law and Economics* 22 (2): 233-261.

---. 1981. "The economics of organization: The transaction cost approach." *American Journal of Sociology* 87 (1): 548-577.

---. 1985. *The Economic Institutions of Capitalism*. Free Press.

---. 1996. *The Mechanisms of Governance*. Oxford University Press.

---. 1999. "Public and private bureaucracies: a transaction cost economics perspectives." *The Journal of Law, Economics, and Organization* 15 (1): 306-342.

---. 2008. "Outsourcing: Transaction cost economics and supply chain management." *Journal of Supply Chain Management* 44 (2): 5-16.

---. 2010. "Transaction cost economics: The natural progression." *American Economic Review* 100 (3): 673-690.

Williamson, Oliver E., Sidney G. Winter, and R. H. Coase. 1991. *The Nature of the Firm: Origins, Evolution, and Development*. New York: Oxford University Press.

Wolf Jr., Charles. 1979. "A theory of nonmarket failure: Framework for implementation analysis." *The Journal of Law and Economics* 22 (1): 107-139.

Young, Dennis R. 1983. *If Not for Profit, for What? A Behavioural Theory of the Nonprofit Sector Based on Entrepreneurship*. Lexington, MA: Lexington Books.

---. 2012. "Government failure theory." In *The Nature of The Nonprofit Sector*, edited by J. Steven Ott and Lisa A. Dicke, 190-192. Boulder, CO: Westview Press.

APPENDICES

APPENDIX A

Public Health Services Provision in Local Health Departments

Instructions

For each activity in the charts on the following pages, check whether and how your LHD and other organizations provided that activity or service in your jurisdiction during the past year.

- Indicate whether your LHD performed the activity and/or contracted out for it.
- “Contracted out” is defined as “Pay another organization to perform this activity or service on behalf of your LHD”.
- Select “Performed by LHD directly” AND “Contracted out by LHD” if your LHD both performed the activity directly and contracted out for it.
- “Provided by others in community independent of LHD funding” means that other organizations provide these services and do not receive funding from the LHD to provide them.
- Other organizations include but are not limited to other state and local government agencies, other healthcare providers (e.g., private physicians, non-LHD clinics, hospitals), schools, and community organizations.

- If a service is provided by the LHD and others in the community, select how the service is provided by the LHD (directly, contracted out, or both) AND select "Provided by others in community independent of LHD funding."
- Do not leave any rows blank.

Resource: 2016 National Profile of Local Health Departments Study

1. Immunization

	Performed by LHD directly	Contracted out by LHD	Provided by others in community independent of LHD funding
Adult immunization			
Childhood immunization			

2. Screening for Disease/Conditions

	Performed by LHD directly	Contracted out by LHD	Provided by others in community independent of LHD funding
HIV/AIDS			
Other STDs			
Tuberculosis			
Cancer			
Cardiovascular disease			
Diabetes			
High blood pressure			
Blood lead			
BMI (Body Mass Index)			

3. Treatment for Communicable Diseases

	Performed by LHD directly	Contracted out by LHD	Provided by others in community independent of LHD funding
HIV/AIDS			
Other STDs			
Tuberculosis			

4. Maternal and Child Health

	Performed by LHD directly	Contracted out by LHD	Provided by others in community independent of LHD funding
Family planning			
Prenatal care			
Obstetrical care			
WIC (Women, Infants & Children)			
MCH home visits			
EPSDT (Early and Periodic Screening, Diagnostic and Treatment)			
Well child clinic			

5. Other Health Services

	Performed by LHD directly	Contracted out by LHD	Provided by others in community independent of LHD funding
Comprehensive primary care			
Home health care			
Oral health			
Behavior/mental health services			
Substance abuse services			

6. Epidemiology and Surveillance Activities

	Performed by LHD directly	Contracted out by LHD	Provided by others in community independent of LHD funding
Communicable/infectious disease			
Chronic disease			
Injury			
Behavior risk factors			
Environmental health			
Syndromic surveillance			
Maternal and child health			

7. Regulation, Inspection and/or Licensing Activities

	Performed by LHD directly	Contracted out by LHD	Provided by others in community independent of LHD funding
Mobile homes			
Campgrounds & RVs			
Solid waste disposal sites			
Solid waste haulers			
Septic systems			
Hotels/motels			
Schools/daycare			
Children's camps			
Body art (tattoos, piercings)			
Recreational water (e.g., pools, lakes, beaches)			
Tobacco retailers			
Smoke-free ordinances			
Lead inspection			
Food processing			
Milk processing			
Public drinking water			
Private drinking water			
Food service establishments			
Health-related facilities			
Housing (inspections)			

8. Other Environmental Health Activities

	Performed by LHD directly	Contracted out by LHD	Provided by others in community independent of LHD funding
Indoor air quality			
Food safety education			
Radian control			
Vector control			
Land use planning			
Groundwater protection			
Surface water protection			
Hazmat response			
Hazardous waste disposal			
Air pollution			
Noise pollution			
Public health nuisance abatement			

9. Other Activities

	Performed by LHD directly	Contracted out by LHD	Provided by others in community independent of LHD funding
Collection of unused pharmaceuticals			
Emergency medical services			
Animal control			
Occupational safety and health			
Laboratory services			
Outreach and enrollment for medical insurance (include Medicaid)			
School-based clinics			
School health			
Asthma prevention and/or management			
Correctional health			
Vital records			

APPENDIX B

Contracting Out for Local Health Services

Instructions

For each activity/service listed the following pages, please rate 1 (low) to 5 (high) for ***asset specificity*** and 1(easy) to 5 (difficult) for ***ease of measurement***.

Asset Specificity: Whether specialized investments are required to produce the service. By special investments, we mean investments that apply to the production of one service but are very difficult to adapt for the production of other services. These specialized investments include

- The use of a specific location that is movable only at a great cost;
- The use of highly specialized human skills that cannot be put to work for other purposes;
- The use of specialized tools or a complex system designed for a single purpose;
- The requirement that the service reach the user within a relatively limited period of time or the quality of the service greatly diminishes.

Low Asset Specificity: A service has a low degree of specialized investments if no specialized investments are generally required to produce the service.

High Asset Specificity: A service has a high degree of specialized investments if many specialized investments are generally required to produce a service.

Ease of Measurement: The ability of the contracting organization to oversee vendor performance or observe how the vendor delivers the service

Easy Measurement: A service is easy to measure if it is relatively straightforward to monitor the activities required to deliver the service and to identify performance measures that accurately represent the quantity and quality of the service. For easy-to-measure services, government officials can easily write a contract and clearly specify the activities and outcomes for the vendor to perform and achieve. Also, it is easy for government officials to monitor the quality and quantity of these activities and their outcomes.

Difficult Measurement: A service is difficult to measure if it is relatively hard to monitor the activities required to deliver the service and to identify performance measures that accurately represent the quantity and quality of the service. For difficult-to-measure services, government officials cannot easily write a contract and clearly specify the activities and outcomes for the vendor to perform and achieve.

Source: Brown and Potoski (2005); 2016 Profile of Local Health Departments (NACCHO)

1. Immunization

Asset Specificity	1(Low)	2	3	4	5(High)
Adult immunization					
Childhood immunization					

Ease of Measurement	1(Easy)	2	3	4	5(Difficult)
Adult immunization					
Childhood immunization					

2. Screening for Disease/Conditions

Asset Specificity	1(Low)	2	3	4	5(High)
HIV/AIDS					
Other STDs					
Tuberculosis					
Cancer					
Cardiovascular disease					
Diabetes					
High blood pressure					
Blood lead					
BMI (Body Mass Index)					

Ease of Measurement	1(Easy)	2	3	4	5(Difficult)
HIV/AIDS					
Other STDs					
Tuberculosis					
Cancer					
Cardiovascular disease					
Diabetes					
High blood pressure					
Blood lead					
BMI (Body Mass Index)					

3. Treatment for Communicable Diseases

Asset Specificity	1(Low)	2	3	4	5(High)
HIV/AIDS					
Other STDs					
Tuberculosis					

Ease of Measurement	1(Easy)	2	3	4	5(Difficult)
HIV/AIDS					
Other STDs					
Tuberculosis					

4. Maternal and Child Health

Asset Specificity	1(Low)	2	3	4	5(High)
Family planning					
Prenatal care					
Obstetrical care					
WIC					
MCH home visits					
EPSDT					
Well child clinic					

Ease of Measurement	1(Easy)	2	3	4	5(Difficult)
Family planning					
Prenatal care					
Obstetrical care					
WIC					
MCH home visits					
EPSDT					
Well child clinic					

5. Other Health Services

Asset Specificity	1(Low)	2	3	4	5(High)
Comprehensive primary care					
Home health care					
Oral health					
Behavior/mental health services					
Substance abuse services					

Ease of Measurement	1(Easy)	2	3	4	5(Difficult)
Comprehensive primary care					
Home health care					
Oral health					
Behavior/mental health services					
Substance abuse services					

6. Epidemiology and Surveillance Activities

Asset Specificity	1(Low)	2	3	4	5(High)
Communicable/infectious disease					
Chronic disease					
Injury					
Behavior risk factors					
Environmental health					
Syndromic surveillance					
Maternal and child health					

Ease of Measurement	1(Easy)	2	3	4	5(Difficult)
Communicable/infectious disease					
Chronic disease					
Injury					
Behavior risk factors					
Environmental health					
Syndromic surveillance					
Maternal and child health					

7. Population-based primary prevention activities

Asset Specificity	1(Low)	2	3	4	5(High)
Injury					
Violence					
Unintended pregnancy					
Chronic disease					
Nutrition					
Physical activity					
Tobacco					
Substance abuse					
Mental illness					

Ease of Measurement	1(Easy)	2	3	4	5(Difficult)
Injury					
Violence					
Unintended pregnancy					
Chronic disease					
Nutrition					
Physical activity					
Tobacco					
Substance abuse					
Mental illness					

8. Regulation, Inspection and/or Licensing Activities

Asset Specificity	1(Low)	2	3	4	5(High)
Mobile homes					
Campgrounds & RVs					
Solid waste disposal sites					
Solid waste haulers					
Septic systems					
Hotels/motels					
Schools/daycare					
Children's camps					
Body art (tattoos, piercings)					
Recreational water (e.g., pools, lakes, beaches)					
Tobacco retailers					
Smoke-free ordinances					
Lead inspection					
Food processing					
Milk processing					
Public drinking water					
Private drinking water					
Food service establishments					
Health-related facilities					
Housing (inspections)					

Ease of Measurement	1(Easy)	2	3	4	5(Difficult)
Mobile homes					
Campgrounds & RVs					
Solid waste disposal sites					
Solid waste haulers					
Septic systems					
Hotels/motels					
Schools/daycare					
Children's camps					
Body art (tattoos, piercings)					
Recreational water (e.g., pools, lakes, beaches)					
Tobacco retailers					
Smoke-free ordinances					
Lead inspection					
Food processing					
Milk processing					
Public drinking water					
Private drinking water					
Food service establishments					
Health-related facilities					
Housing (inspections)					

9. Other Environmental Health Activities

Asset Specificity	1(Low)	2	3	4	5(High)
Indoor air quality					
Food safety education					
Radian control					
Vector control					
Land use planning					
Groundwater protection					
Surface water protection					
Hazmat response					
Hazardous waste disposal					
Air pollution					
Noise pollution					
Public health nuisance abatement					

Ease of Measurement	1(Easy)	2	3	4	5(Difficult)
Indoor air quality					
Food safety education					
Radian control					
Vector control					
Land use planning					
Groundwater protection					
Surface water protection					
Hazmat response					
Hazardous waste disposal					
Air pollution					
Noise pollution					
Public health nuisance abatement					

APPENDIX C

All the Public Health Service Modes

TABLE XV. DISTRIBUTION OF ALL THE PUBLIC HEALTH DELIVERY MODES

Delivery Modes	Freq.	Percent
LHD	13,711	17.78
Contracting out	896	1.16
LHD & Contracting out	311	0.40
LHD & Others	23,447	30.40
Contracting out & Others	1,265	1.64
LHD & Contracting out & Others	1,032	1.34
Others	33,489	43.42
No provision	2,972	3.85
Total	77,123	100.00

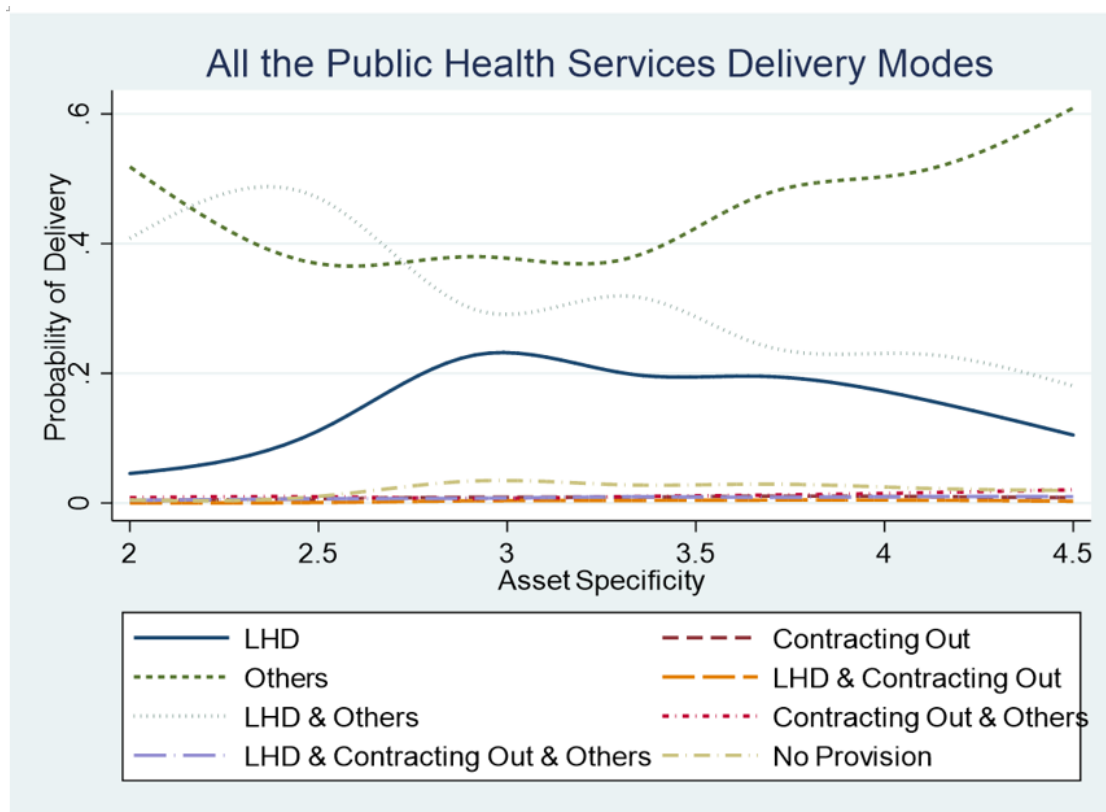


Figure 10. Predicted probability of local public health service provision by asset specificity

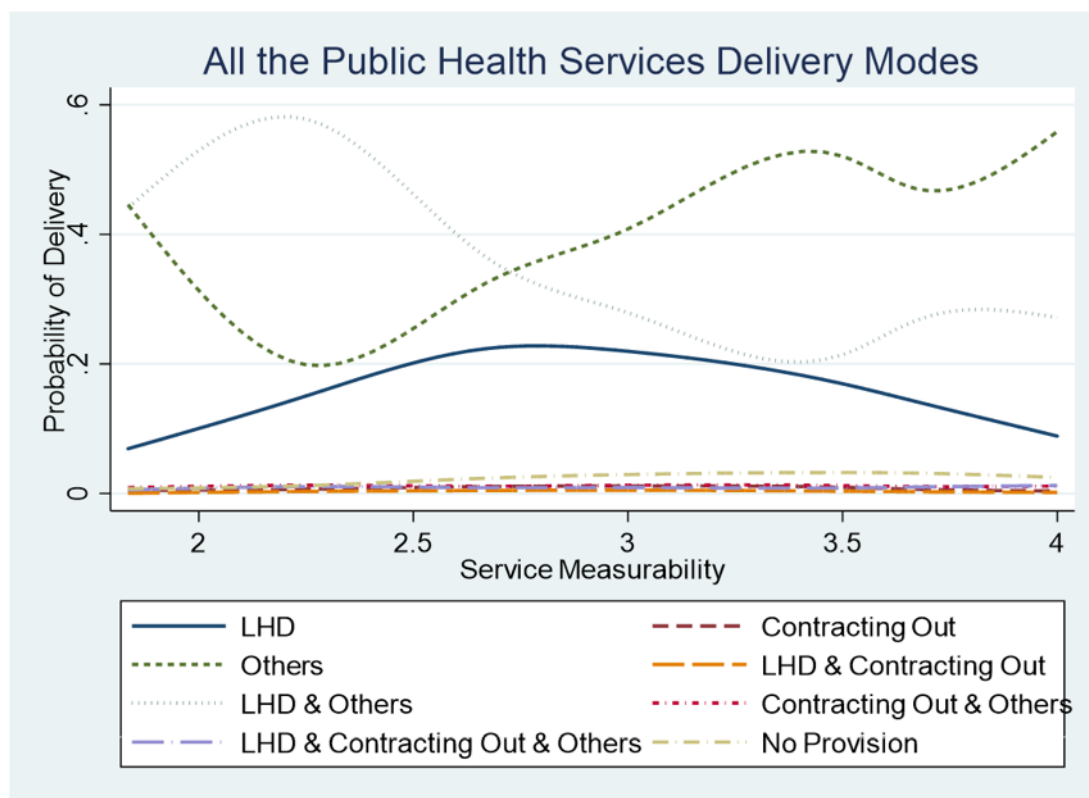


Figure 11. Predicted probability of local public health service provision by service measurability

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- Zhao, Tianshu, and Kelly LeRoux. 2019 (accepted). "Does Outsourcing Public Health Services Lead to Better Health Outcomes? Findings from a National Study of Local Health Departments" in *Revisiting Performance in the Hollow State*, edited by Kelly LeRoux and Nathaniel Wright.
- Holbrook, Allyson, and David Sterrett, Andrew W. Crosby, Marina Stavrakantonaki, Tianshu Zhao, and Timothy Johnson. 2019. "Survey Experiments and Changes in Question Wording in Repeated Cross-Sectional Surveys." in *Experimental Methods in Survey Research*, edited by Paul J. Lavrakas.
- Merriman, David, Di Qiao, and Tianshu Zhao. 2018. "Evidence about State Use of Tax Increment Financing." *State Tax Notes*, 4:4-9.

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- PMRA Doctoral Student Development Workshop, 2019
- Graduate Student Presenter Award, University of Illinois at Chicago, 2019
- AAPOR's Got Talent (AGT) Competition Winner (Team led by Dr. Allyson Holbrook), 2018
- ICPSR Summer Program Award, University of Illinois at Chicago, 2018
- Student Travel Award, American Association for Public Opinion Research Conference, 2016

TEACHING EXPERIENCE

PPOL 230 Nonprofit Organizations and Civil Society (undergraduate), Spring 2020, UIC
PA 553 State and Local Public Finance (MPA), Spring 2018, UIC
PA 550 Financial Management of Government (MPA), Fall 2017, UIC
PA 552 Capital Budgeting and Finance (MPA), Fall 2017, UIC
PA 403 Economics for Management and Policy (MPA), Spring 2017, UIC
PA 506 Public Policy Process and Analysis (MPA), Spring 2017, UIC
PA 403 Economics for Management and Policy (MPA), Fall 2016, UIC
PA 494 Cost Benefit Analysis (MPA), Spring 2016, UIC
PA 552 Public Capital Budgeting and Finance (MPA), Spring 2016, UIC
PA 494 Capital Markets and Entrepreneur (MPA), Fall 2015, UIC
PA 550 Financial Management of Government (MPA), Fall 2015, UIC

PROFESSIONAL SERVICE

Session Chair, ARNOVA Conference, San Diego, CA, 2019
Volunteer, APPAM Conference, Denver CO, 2019
Volunteer, APPAM Conference, Washington DC, 2018
Session Chair, APPAM Conference, Chicago, IL, 2017
Session Chair, ARNOVA Conference, Grand Rapids, MI, 2017
Volunteer, MPSA Conference, Chicago, IL, 2017
Volunteer, ASPA Conference, Chicago, IL, 2015

PROFESSIONAL AFFILIATIONS

Public Management Research Association (PMRA)
Association for Research on Nonprofit Organizations and Voluntary Action (ARNOVA)
Association for Public Policy Analysis and Management (APPAM)
American Society for Public Administration (ASPA)
Midwest Political Science Association (MPSA)