

Knowledge Advancement in Nonprofit and Public Management Research

The Potential of Meta-Analysis

by

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## ABSTRACT

Knowledge advancement occurs when the creation of new and useful knowledge encompasses and supersedes earlier knowledge. A rapidly growing number of scholars with state-of-the-art research tools has led to the growth of knowledge exploration in almost every field. It, however, has been observed that the findings of new studies frequently differ from previously established evidence and even disagree with one another. Conflicting and contradictory results prevail in the literature. This phenomenon has puzzled many people with respect to which findings are reliable and which should be considered as valid. Inconclusive results in the literature inhibit, rather than facilitate, knowledge advancement in sciences. Meta-analysis, which is referred to as the analysis of analyses, designed to synthesize findings from a large collection of quantitative analyses that produce inconsistent results has become a major research method in the fields of medicine, education, and psychology; however, the method has been slow to penetrate research in nonprofit and public management (NPM). This study, therefore, discusses how meta-analysis contributes to knowledge advancement in the fields of nonprofit and public management by using nonprofit commercialization as an example to examine its impact on nonprofit capacity and donations, respectively. The attention of this discussion is directed toward how the use of meta-regression models is able to offer new and useful knowledge that encompasses and supersedes earlier knowledge in the literature with evidence-based results. Moreover, this study examines whether the use of SEM-based meta-analysis produces equivalent results when compared with results from

traditional meta-regression models. The comparison results suggest that the use of SEM-based meta-analysis is able to produce equivalent results even when missing data are present. Overall, this study makes at least two contributions. First, it introduces a newly-developed method for conducting meta-analysis to the field of NPM. This method is especially useful when there are missing data in data sets. Second and most importantly, this study demonstrates how knowledge advancement in NPM can be achieved by conducting meta-analysis.

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## CHAPTER 1

### KNOWLEDGE ADVANCEMENT IN NONPROFIT AND PUBLIC MANAGEMENT

#### RESEARCH

Knowledge advancement is defined as “making progress in understanding new phenomena.” Many original contributions that improve our understanding of the world starts with an insight into knowledge generated by prior researchers. Inspired by literature or real-life phenomena, knowledge investigators explore new research questions and examine new hypotheses for explaining present circumstances and predicting future trends. Since one research result is only suggestive, research questions and hypotheses are required to be repeatedly validated to ensure the linkage between novel ideas and empirical data is solid enough to advance the understanding of new phenomena (Mahoney, 2003; Wagner & Berger, 1985). Knowledge is aggregated and then advanced when the explorations and validations are rigorously and gradually completed (Freese, 1980; Popper, 2014).

A rapidly growing number of scholars with state-of-the-art research tools has led to fast growth in knowledge exploration and validation in almost every research field (Ringquist, 2013). It is common to find that many studies have been devoted to the same research questions with different measures, data, theories, or research techniques.

Optimistic observers believe that these advances expedite knowledge growth. Repeated explorations and validations using different measures, data, theories, and research techniques are viewed as a necessary stepping stone to knowledge advancement. This path is challenging when research on the same questions produces inconsistent results.

New research explorations, time and time again, challenge rather than validate existing knowledge (Hunt, 1997). Knowledge explorations and validations, in these cases, fail knowledge advancement.<sup>1</sup>

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<sup>1</sup> Hunt (1997, p.1) offers an insightful observation on this phenomenon: “virtually every field of science is now pervaded by a relentless cross fire in which the findings of new studies not only differ from previously established truths but disagree with one another, often vehemently. Our faith that scientists are cooperatively and steadily enlarging their understanding of the world is giving away to doubt as, time and time again, new research assaults existing knowledge”.

This phenomenon is especially likely to occur in organizational sciences. Compared to other social sciences, such as psychology and economics, Pfeffer (1993) argues that organizational studies have “a fairly low level of paradigm development” (p.607). Organizational sciences, in general, encourage the development of theoretical and methodological pluralism. Scholars commonly use very distinct theoretical models to guide research procedures and frequently employ very different approaches to measure variables. This leads to theoretical disputes and debates that are rarely solved. Unsolved theoretical disputes and debates worsen the progress in understanding new phenomena in organizational sciences (Pfeffer, 1993).

Meta-analysis offers a set of techniques to synthesize inconclusive and inconsistent results. It promises to be an effective tool for knowledge aggregation and has a potential to contribute to knowledge advancement. Meta-analysis, in Schmidt’s language, is to “make sense of the vast number of accumulated study findings” (Schmidt, 1996, p. 123). Instead of producing more primary studies that might get more confused results, the need, in many cases, is for meta-analyses to build a body of cumulative

knowledge and to provide robust guidelines for professionals and policy makers (Ringquist, 2013). Specifically, meta-analysis provides an average global effect size for the estimate of an overall relationship between variables of interest. It also answers questions regarding how and why primary studies arrive at different results by using meta-regression techniques. Results from meta-analysis are necessary in demonstrating parsimonious integrations and explanations for complex bodies of knowledge, in helping build theories, and in guiding future research directions for a field.

This chapter discusses how meta-analysis contributes to knowledge advancement in the fields of nonprofit and public management (NPM). I, first, discuss knowledge advancement in organizational sciences. Next, I analyze the advantages and disadvantages of employing traditional literature reviews to summarize scientific evidence and explain why meta-analysis is a better option. Finally, I introduce meta-analysis and investigate the status of using meta-analysis to conduct research in NPM.

Overall, I demonstrate how macro-level meta-analysis treats each micro-level individual study as a data cluster to offer a holistic view of scientific status in the fields of NPM and discuss how and why scientific progress in NPM can be better advanced through meta-analysis. The potential of meta-analysis in knowledge advancement indicates its possible contributions to theoretical consensus building, research directions, management practice, and policy making.

### **Knowledge Advancement in Organizational Sciences**

Since its publication, *The Structure of Scientific Revolutions*, which provides readers with a discussion of the history of science and paradigm development, has become widely circulated. Broadly speaking, a paradigm in a scientific community, in Kuhn's (1970) language, refers to "the entire constellation of beliefs, values, techniques, and so on shared by the members of a given community" (p. 175). A paradigm provides rules and standards for scientific inquiries. Researchers who are committed to paradigms believe that their own approaches can do most to solve research questions recognized as

acute. Their deep hold on paradigms is sufficient to attract a group of adherents away from competing camps of academic activities and to prepare the next generations of students for professional practices. A paradigm is essential to scientific inquiry in that it helps scientific communities bound disciplines. It can define research areas of relevance, formulate research questions, and select research questions (Kuhn, 1970).

Natural sciences, such as physics and chemistry, or some social sciences, such as economics and psychology are more likely to evolve a dominant paradigm (Pfeffer, 1993). A paradigm in these disciplines often starts with an inquiry that draws ideas from a group of scholars who attempt to interpret a phenomenon in different ways. As more scholars venture into the inquiry, the discussion soon turns into a debate that attracts widespread attention and divides scholars into different camps. A school that is better than its competitors in explaining the inquiry emerges as a dominant paradigm that guides the whole group's research (Kuhn, 1970). A paradigm development like this is more likely to be seen in these disciplines in which scholars confront more concentrated research questions. For example, one of the earliest attempts by economists was to



explain why goods are exchanged for certain relative prices in the market (Stanfield, 1974). The debate over which thought, fact, and method is better to explain the price theory led to the existence of several competing schools. As the debate evolved, the school of marginal utility demonstrated its advantages to explain the price theory over its competitors (e.g., the labor theory of value). This camp dominated the discussion and emerged as a dominant paradigm.

Organizational science, however, is considered to be a field that lacks a dominant paradigm (Pfeffer, 1993). In other words, it “achieves” a low level of paradigm development. Organizational science as an interdisciplinary field lacks a unifying mechanism (Barsade, Brief, Spataro, & Greenberg, 2003; Jones, 1983; Pfeffer, 1993; Pfeffer, 2007). Many scholars enter the field because it encourages pluralism (Pfeffer, 1993). The pluralism of organizational science can be observed in at least three ways (Jones, 1983; Rousseau, 2007). First, the field borrows theories from a variety of disciplines, such as economics, political science, sociology, and law. Second, various methodological approaches have been used to address research questions. Third,

researchers conduct organizational research with diversity of values and education background. Given that there is no integrating theory, methodological approach, and value in organizational science, it is not surprising that there is no dominant paradigm in the files. We lack a model that has “macro-level predictive and explanatory capacity” in organizational science (Jones, 1983, p.559).

No one paradigm is shared by all field members. Instead, the diverse research activities lead to multiple paradigms in organizational sciences. Organization scientists rarely link the concept of paradigms back to Kuhn (1970) who argues multiple competing schools in a field would eventually converge into a paradigm. Organization scientists have found that embracing ontological, epistemological, and methodological differences between major theory groups is more important than identifying classic laws and theories that lead to a dominant paradigm emphasized by Kuhn (Burrell & Morgan, 2006; Hassard, 1991; Hassard, 1993; Lincoln, 1985). Scholars’ different beliefs on the three different areas (i.e., ontological, epistemological, and methodological) classify them into different paradigm groups (Lincoln, 1985). For example, Burrell and Morgan (2006) suggest that

since the differences in scholars' beliefs of ontology, epistemology, and methodology, all organizational science output better to be located within four paradigms: functionalism, interpretivism, radical humanism, and radical structuralism. Organization scientists from different paradigms use different philosophical thinking to answer research questions. Unlike the school of marginal utility that has dominated economics for so long, there is no dominant school in organizational science. Pluralism leads to multiple paradigms in organizational science.

Although embracing pluralism is a common practice, the activity, to some degree, has impeded knowledge advancement in organizational sciences. In many cases, pluralism makes very difficult consensus on many research questions and topics. The lack of consensus hinders our ability to make progress in understanding new phenomena. For instance, functionalists examine the relationship between high performance work practices and organizational performance with different sample characteristics, research designs, and organizational performance measures. Not surprisingly, they produce inconsistent findings on whether high performance work practices lead to better

organizational performance (Combs, Liu, Hall, and Ketchen, 2006). The inconsistent findings urge scholars to equip themselves with techniques that can help field members achieve consensus on the topic. Reaching consensus allows field members to have more efficient communication and to spend less time on defining terms, explaining concepts, and debating findings from the literature (Salancik, Staw, & Pondy, 1980). In short, the route to knowledge advancement in organizational sciences could start with consensus building since consensus building is a necessary condition for knowledge advancement (Pfeffer, 1993).

The consequences of weak consensus building efforts in organizational science are far-reaching. Inconclusive and inconsistent results compromise the usefulness of scientific research as a means for addressing practical issues in society. Practitioners puzzle about which result is reliable (Ringquist, 2013). Also, policy makers have been disappointed with the inconsistent, sometimes even contradictory, research results, especially findings from behavior and social sciences (Schmidt, 1996). Some research funding agencies cut research grants in these areas; others request for developing new

tools to better communicate the complexity of research results (Pfeffer, 1993; Ringquist, 2013; Schmidt, 1996). The cycle of these negativities even makes some scholars question the value of their own research (Cronbach, 1957; Schmidt, 1996). Most importantly, as noted above, inconclusive and inconsistent results inhibit knowledge advancement.

### **Solutions to the Scattered Knowledge in Organizational Sciences**

A common solution to reach consensus on inconsistent findings and to move scientific progress forward is to conduct a narrative or systematic literature review that summarizes prior studies, presents the status of knowledge, and suggests the directions of future research. Most traditional literature reviews in organizational science are written for these purposes. For example, in their review of studies that looks at the effect of the price on giving decisions, Wong and Ortmann (2016) synthesized studies that address the effect by analyzing research conclusions from previous survey and empirical evidence, explaining under which circumstances donors care about the price, and proposing future

research directions.<sup>2</sup> Other literature reviews, such as a study on public service motivation conducted by Ritz, Brewer, and Neumann (2016) and a study on the relationship between green management and financial performance conducted by Molina-Azorín, Claver-Cortés, López-Gamero, and Tarí (2009), serve the same purpose.

Traditional literature reviews are valuable, and their importance would not be less than that of other literature synthesis methods. However, at least two limitations affect the usefulness of traditional literature reviews in knowledge advancement. First, traditional literature reviews are not parsimonious. They often integrate two or more bodies of research or consider multiple research questions in a narrative. The problem is that merely adding more studies and integrating them in a review is not sufficient for knowledge advancement. Knowledge advancement occurs when studies, built on previous ones, add proportionately less information to the literature and make that less count for more (Freese, 1980). For example, a traditional literature review on the

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<sup>2</sup> Price refers to overhead costs incurred by nonprofits in the provision of services and information costs incurred by donors in the search of nonprofits to make contributions.

interactions of nonprofit revenues could solely focus on the relationship between government support and nonprofit donations, broadly offering implications for theories and practices based on the results of the review. Second, traditional literature reviews are not effective in making precise statements about the magnitude of effects reported in previous studies (Ringquist, 2013). They often focus on statistical significance ( $p$  value), making their conclusions based on whether studies reject null hypotheses and how many studies reject null hypotheses without digging in to the “real” effects between or among variables of interest. Traditional literature reviews’ conclusions are relatively vague, and, sometimes, even misleading.

In the field of nonprofit finance, Froelich’s (1999) review summarizes previous studies that investigate revenue diversification in nonprofits, explores the interaction effects among nonprofit revenues, and suggests directions for future research. The paper contributes to our understanding of the advantages and disadvantages of getting nonprofits involved in various revenue streams. It is also one of most widely cited paper in the nonprofit research field. The paper, however, suffers from the same limitations —

not parsimonious in explaining results and not effective in making precise statements regarding the revenue interaction effects — as many other traditional literature reviews. After her comprehensive review of the literature, Froelich (1999) concludes that the interaction effects among nonprofit revenues are mixed and the effects of revenue diversification on individual nonprofits are inconclusive. A holistic view of the knowledge status in nonprofit revenue interactions was offered by Froelich (1999); however, few definitive conclusions could be drawn from the paper. In other words, the paper describes the state of a literature but makes relatively little progress in knowledge advancement.

The two limitations of traditional literature reviews can be addressed by the use of meta-analysis. First, instead of including multiple research topics or questions in a review work, meta-analysis targets a specific research question. For example, unlike Froelich's (1999) discussion of nonprofit revenue diversification involving various interactions among sources of funds, meta-analysts, in general, choose a particular relationship



between two forces. An example of this is de Wit and Bekkers' (2017) meta-analysis that examines the relationship between government funding and nonprofit donations.

Second, instead of focusing on statistical significance, meta-analysts use effect sizes to measure relationships between the variables of interest (Card, 2012). It is common to see that traditional literature reviews make conclusions based on the number of papers they review that are statistically significant. They often conclude that the relationship between two variables of interest is positive if the number of positive statistically significant papers they review is greater than the number of negative statistically significant papers they review. However, the conclusion based on this counting approach should be interpreted with caution since the use of this approach is not able to reflect a real effect between the variables of interest (Gurevitch, Koricheva, Nakagawa, & Stewart, 2018). Instead, meta-analysts discard statistical significance and use effect sizes to draw conclusions. Its conclusions go beyond dichotomous classifications (i.e., the number of positive or negative relationships) of research results, and its results offer clear effects between or among variables of interest.

In comparison, traditional literature reviewers offer a holistic analysis of a variety of research questions, whereas meta-analysts provide a specific analysis to an individual research question. A group of research questions discussed by traditional literature reviewers in a study can be sliced into several individual pieces of meta-analysis for more parsimonious and precise conclusions. For example, Froelich's (1999) review of nonprofit revenue interactions can be cut into three research questions, such as the impact of government support on private donations (de Wit & Bekkers, 2017; Lu, 2016), the influence of revenue diversification on organizational financial health (Hung & Hager, 2018), and the relationship between commercial revenues and private donations. Meta-analysis' focus on a specific research question with quantitative calculations of effect sizes is considered helpful in reaching consensus on research questions that produce inconsistent results, which in turn facilitates knowledge development in organizational science.

### **Introducing Meta-Analysis**

In his pioneering article, *Primary, secondary, and meta-analysis of research*, Gene Glass coined the term meta-analysis (Glass, 1976). Meta-analysis, in Glass' definition, refers to the analysis of analyses. It is a "statistical analysis of a large collection of analysis results from individual studies for the purpose of integrating the findings" (Glass, 1976, p.3). Glass' article was written at the time when education research on dozens of topics was growing at a rapid rate. The rapid growth in the literature, unexpectedly, came with inconclusive research findings that failed knowledge aggregation and advancement. Glass (1976), therefore, deemed it fitting that education scholars should start using meta-analysis to summarize and compare scattered results of foregoing empirical studies through effect sizes that represent the magnitude and direction of relationships between variables of interest. Glass (1976) suggested that "the best minds are needed to integrate the staggering number of individual studies. (p.4)"

Besides the pioneering article, Smith and Glass' study of the effectiveness of psychotherapy treatments is considered the field's most influential meta-analysis (Glass,

1976, 1977; Smith & Glass, 1977). Their study aimed to (1) identify studies that examined the effect of psychotherapy and counseling, (2) calculate the magnitude of effect of the therapy for each collected study, (3) compare the effects of different types of therapy, and (4) detect whether effect sizes vary according to the characteristics of the therapy. Their analysis of 833 effect sizes from 375 studies with around 40,000 subjects underscored the effectiveness of psychotherapy treatments. Also, it showed how to examine the difference between behavioral therapies and nonbehavioral therapies. In short, the analysis demonstrated that meta-analysis is a powerful tool to integrate research findings and facilitate knowledge development. It, first, offers a clear-cut quantitative estimate of a treatment effect with excessive statistical power to detect negligible variability to reach an overall understanding of the research question.<sup>3</sup> It then provides scenarios that involve effect sizes under different conditions to identify sources of variation in research outcomes.

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<sup>3</sup> One of the most commonly mentioned reasons for conducting a meta-analysis is that the method increases statistical power. Hunter and Schmidt, 1990 (p. 75) argue that “the problems created by low statistical power in individual studies are central to the need for meta-analysis.”

Therefore, it is not surprising that meta-analysis has become one of the major research methods in the fields of education, psychology, and medicine over the past forty years (Shadish & Lecy, 2015). In general, two types of meta-analysis have been widely used in the fields (Gurevitch, et al., 2018). The first type is to examine the evidence for the effectiveness of certain interventions for a particular issue or to test causal relationships for a research question. For example, researchers examine whether vitamin B is beneficial or harmful to people with a particular disease (Larsson, Orsini, & Wolk, 2010). This type of meta-analyses often involves a relatively small number of primary studies (i.e., fewer than or around 25 articles). The second type is to reach broader generalizations and to provide a more comprehensive picture of research questions of interest by synthesizing several dozens to hundreds of articles. Smith and Glass' study of the effectiveness of psychotherapy treatments is this type of meta-analysis where they broadly examine evidence of the effects from multiple therapies. Although Gurevitch et al., (2018) discuss the differences in approaches to conducting meta-analysis between the two types, meta-analyses generally follow six steps described in detail later in the following section. The six steps are to (1) identify research questions, (2) conduct

literature search, (3) do data coding, (4) calculate effect sizes, (5) explain variation in effect sizes, and (6) draw conclusions from results.

### **Using Meta-Analysis for Nonprofit and Public Management**

The difficulties in moving scientific progress forward are no less daunting in the scholarship of NPM; however, meta-analysis had been slow to penetrate research in the field. For example, journals in the field of education published around 18 meta-analysis studies per year between 1980 to 2010. By contrast, public management and policy journals published roughly one meta-analysis article per year over the same period (Ringquist, 2013). Only one meta-analysis study in the field of nonprofit management can be found in the same period (Shoham, Ruvio, Vigoda-Gadot, & Schwabsky, 2006; Table 1). Not until the year of 2014 did we start to observe an influx of NPM publications using meta-analysis.

Table 1

*Average Number of Meta-Analysis Published Each Year in the Fields of Education, Public Management and Policy, and Nonprofit Management between 1980 to 2010*

Academic Discipline	Average Number
Education	18
Public Management and Policy	1
Nonprofit Management	0.03

Note. The average numbers for the fields of education and public management and policy are from Ringquist (2013, p.7). The average number for the field of nonprofit management is based on my searches of Proquest, SSCI, and EBSCO databases/platforms.

To know the topics examined by scholars using meta-analysis in NPM, I search the *Social Sciences Citation Index (SSCI)* Database for meta-analysis papers published in NPM-related journals. The search of the SSCI Database (search date: 4/29/18) found 20 NPM papers that use the term *meta-analysis* in the paper titles or/and abstracts.<sup>4</sup> These

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<sup>4</sup> There are four papers using the term “meta-analysis” in either paper titles or abstracts; however, they do

papers can be grouped into three categories in terms of sector focus. First, of the 20 papers found, 12 studied public organizations. Although a variety of topics were investigated, around half of which centered on public service motivation, job satisfaction, and organizational performance. Second, four papers focused on cross-sector organizations, three of which examined the relationship between government funding and nonprofit advocacy or donations. Finally, four papers addressed nonprofits. The four papers investigated very different topics. An interesting finding from these 20 publications is that 17 of them were published in or after 2014 (Figure 1). In other words, meta-analysis has gained popularity as a research method for the field in recent years.

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not use any meta-technique to summarize and compare quantitative findings and are referred to as meta-analyses. These four papers are not included in my discussion here.



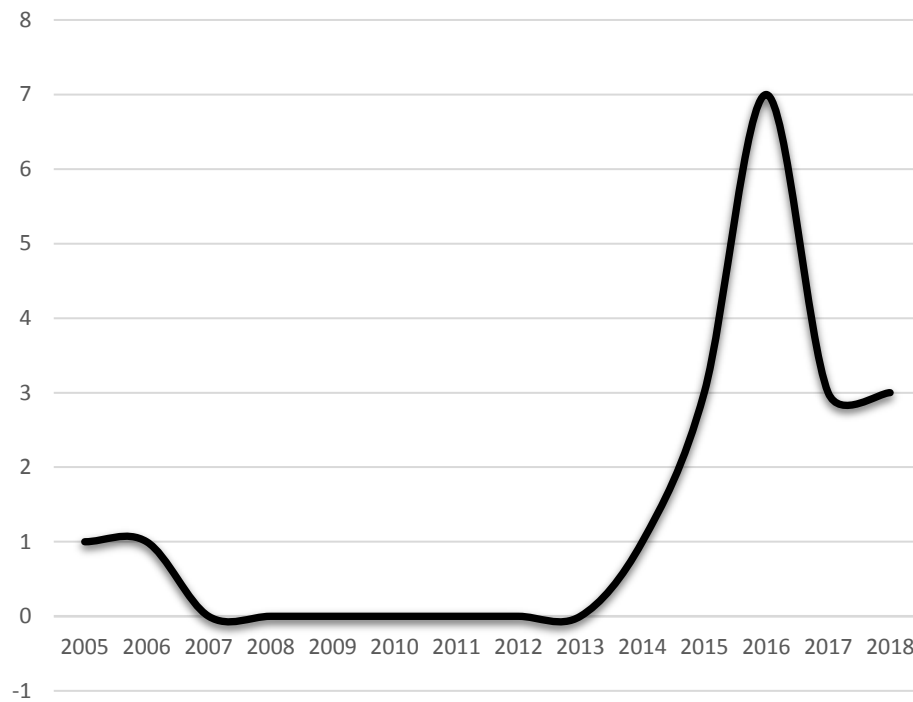


Figure 1. *Number of Meta-Analysis Published Each Year in NPM*

The reasons why meta-analysis starts playing a more significant role in NPM research can be attributed to the following facts (Ringquist, 2013). First, unlike research in fields such as medicine and psychology, research in NPM uses experiments less frequently, which makes results in NPM research more heterogenous than research in medicine and psychology (i.e., less likely to reach consensus). Second, NPM researchers tend to develop their own measurement instruments rather than use common validated

scales to make variable measurements consistent with prior studies. Therefore, studies on the same subject in NPM sometimes produces very disparate patterns of results that fail knowledge aggregation and advancement. In other words, research in NPM, in many cases, makes relatively less progress in understanding new phenomena. Third, the quality of empirical studies in NPM has improved in the past decades. Using advanced techniques to estimate causal relationships and reduce estimation bias has been commonly seen in the literature, which provides better estimates. Fourth, the techniques of meta-regression models used to examine the variation in effect sizes have matured over the past decades. A variety of meta-regressions are now available and reliable for meta-analysts to handle the potential methodological issues of effect-size heteroscedasticity and non-independence of observations. Fifth, the use of meta-analysis echoes the demands from the field of NPM for evidence-based research. Finally, the results from meta-analysis offers public service professionals a holistic view of questions of interest, which also provides them with guidelines on what to do under certain circumstances.

The use of meta-analysis in NPM is still in its early stage. Many research questions have yet to be addressed in the field. A list of potential research questions that are appropriate for research by using the meta-analysis techniques have been proposed by a group of public management scholars who focus their studies on different subfields. These research questions include why governments contract for services, what the effects of contract design on policy performance are, and whether “pay-for-performance” improves organizational performance (Ringquist, 2013). A similar list can be readily proposed for nonprofit management research as well. Inconclusive and inconsistent results are ubiquitous in NPM and meta-analysis could be a promising tool to synthesize the findings and to advance knowledge development. Around 40 years ago, Glass called for an endeavor to integrate the staggering number of individual studies in education and psychology research (Glass, 1976). The publications using the meta-analysis techniques in the fields has boomed since then (Shadish & Lecy, 2015). Now is the time for NPM scholars to set higher priority for meta-analysis rather than add a new empirical study to the piles of scattered inquiries.

Conducting a meta-analysis starts with identifying a research topic and formulating a research question. It synthesizes results from original studies regarding a (set of) relationship(s) of interest or treatment effect. The results from original studies should be unsettled. For example, scholars have investigated whether government support crowds out nonprofit donations (de Wit & Bekkers, 2017; Lu, 2016), and whether revenue diversification is associated with nonprofit financial health (Hung & Hager, 2018). In these cases, the original studies that examine the relationships produce inconsistent results, which suggests that a study to synthesize the mixed results is required.

Next, a systematic, comprehensive and replicable literature search is conducted to identify original studies that examine the hypotheses for statistical inference. Several literature search strategies can be employed: database searches, backward and forward searches, author and journal searches, and google searches.<sup>5</sup> These searches can identify

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<sup>5</sup> Backward searches refer to identifying references cited in original studies obtained from database searches whereas forward searches refer to identifying references cite the original studies.

original studies in grey literature, such as conference papers, dissertations, government publications, and think tank publications, to handle a potential publication bias issue as well.<sup>6</sup> Many meta-analyses commonly synthesize the results from peer-reviewed studies, which might lead to the overestimation of effect sizes on a particular research question.<sup>7</sup> The overestimation is more likely to occur in the field of public management and policy in which many reliable and valid empirical studies are conducted by think tanks, government agencies and policy research firms. More accurate estimations can be obtained when meta-analysts include grey literature as well.

Third, meta-analysts extract data from original studies to build a meta-analysis data set. In general, meta-analysts code three types of information from original studies for further analyses. (1) information on relevant studies such as author(s) and publication era. This serves as background information for effect sizes and study characteristics.

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<sup>6</sup> Grey literature here refers to unpublished studies.

<sup>7</sup> Meta-analyses that only synthesize results from published studies might not necessary lead to overestimation of effect sizes since, in some cases, unpublished studies produce more significant results of relationships than published studies. That is, excluding unpublished studies is likely to underestimate relationships as well. Thus, publication bias is not all about overestimation bias, especially in the scenarios where unpublished studies might produce more significant results than published studies.

However, in some cases, this could also be used as moderators to examine the variation in effect sizes. For example, researchers might be interested in whether articles that publish in or after a certain year report higher effect sizes. (2) information useful to calculate effect sizes such as parameter estimates and t-statistics. This is the micro data for meta-analysis. The whole meta-analysis is based on effect sizes. (3) information necessary to examine the variation in effect sizes within and across studies. The information could be derived from theoretical questions, measurement choices, and model specifications. For example, researchers might be interested in whether studies that use experimental designs have reported lower effect sizes than studies that use other research designs.

Fourth, meta-analysts calculate and combine effect sizes after coding useful and necessary data from original studies. Three types of effect sizes are commonly used in meta-analyses: r-based, d-based, and odds-based effect sizes. Scholars in nonprofit and public management typically employ r-based effect size (Ringquist, 2013). It is a standardized effect size that measures the relationship of the two variables of interest. It

represents the correlation coefficient between the variables of interest. Meta-analysts first calculate effect sizes across original studies. Some original studies report only a few effect sizes while others report many effect sizes. All effect sizes that are related to the research questions of interest should be included in meta-analysis. After calculating effect sizes, meta-analysts then combine effect sizes into a mean effect size weighted by sample sizes of original studies to estimate the expected population effect size. The average effect size is more useful in interpreting the results from the first type of meta-analysis where scholars focus on a very specific research question.

Fifth, meta-analysts explain variation in effect sizes across original studies using meta-regression models. This is the most important part of meta-analysis in NPM since original studies in the field frequently use different outcome measures, statistical techniques, or data structures and yield very heterogeneous effect sizes. Meta-regression models are able to examine, for example, whether data structure characteristics such as the use of panel data influence average effect sizes across original studies, whether one education policy is better than the other to promote student academic achievement, or

whether local government funding is more likely to crowd out nonprofit donations than federal government funding. Although many moderators can be put into meta-regression models to examine variation in effect sizes, those moderators that are able to contribute to theoretical understanding deserve more attention.

Finally, meta-analysts present results and conclude with implications and suggestions for future research. Multiple contributions can be made by using meta-analysis to examine research questions in NPM. For example, the results from a meta-analysis examining the relationship between government support and nonprofit donations can guide nonprofit professionals in their management of revenue streams and give policy makers a holistic view of the influence of government funding on nonprofit organization. Based on that, better management and policies for nonprofits can be expected (de Wit & Bekkers, 2017; Lu, 2016). Most importantly, the comprehensive synthesis of original studies reveals the patterns of accumulated knowledge of the research question and provides directions for future studies. Ringquist (2013) offers additional details on this six-stage process of conducting a meta-analysis (Figure 2).



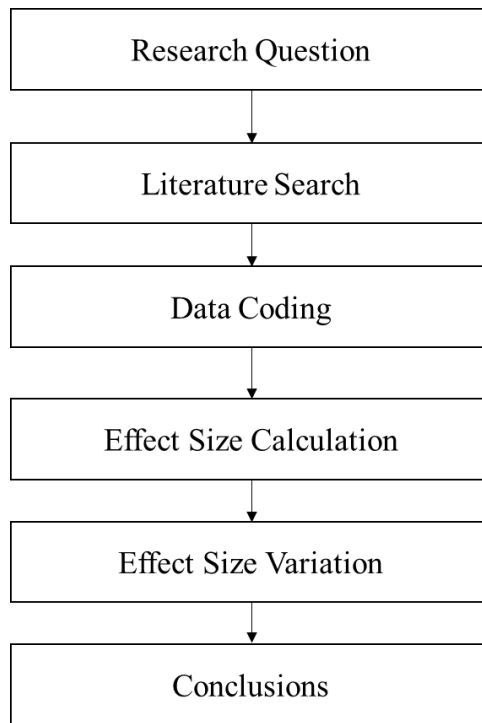


Figure 2. *Six-Stage Process of Conducting a Meta-Analysis*

However, meta-analysis is subject to multiple limitations. First, similar to conducting traditional literature reviews, meta-analysts need to make judgement calls while conducting a study. For example, meta-analysts must establish a set of criteria for article selection and decide which articles to include in a meta-analysis. These decisions are often based on a researcher's own judgement and experience. Also, meta-analysts

need to make decisions regarding how to calculate effect sizes (Guzzo, Jackson, & Katzell, 1987). Thus, the results of meta-analysis are likely affected by the decisions made by researchers. Third, meta-analysts can only code from primary studies that provide sufficient information. Studies that do not offer information to calculate effect sizes or necessary study characteristics are excluded from meta-analysis. This exclusion calls sample representativeness into question (Guzzo et al., 1987; Hunter & Schmidt, 2014).<sup>8</sup> Fourth, since the focus of a meta-analysis is the effect sizes produced by quantitative studies, much attention in the analysis is about how to calculate a weighted mean effect size and how to explain the variation in effect sizes. Therefore, important advances from qualitative and case analyses are often not included. Finally, although including a dichotomous moderator that differentiates published papers from unpublished ones in meta-regression models is able to test whether unpublished studies, on average,

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<sup>8</sup> Missing data issue is common in meta-analyses. A “take-for-granted” practical suggestion to meta-analysts is to exclude studies that do not provide sufficient information. However, as mentioned above, this practice calls sample representativeness into question. The results from meta-analyses using the exclusion strategy are very likely to be biased. A better method to handle missing data is needed. Methodologists have proposed several methods for researchers to handle missing data. Of the methods introduced, Full Information Maximum Likelihood (FIML) is considered to be superior to other methods of handling missing data. In Chapter 3, I examine whether the use of FIML is able to produce equivalent results. If yes, the “take-for-granted” practice should not be considered and FIML is encouraged to use when conducting meta-analysis.

report lower effect sizes and whether the overall effect size is overestimated (Lipsey & Wilson, 2001), meta-analysis is not be able (or has not been used) to detect p-hacking behavior where researchers manipulate data in order to present statistical significance when in fact there is no real effect.

In the next two chapters, I use nonprofit commercialization as an example to illustrate how meta-analysis facilitates knowledge aggregation and contributes to knowledge advancement in the field. I first discuss nonprofit commercialization in the next chapter and then conduct the meta-analysis in Chapter 3.

## CHAPTER 2

### NONPROFIT COMMERCIALIZATION

In this chapter, I first provide an overview of the current state of nonprofit finance research, then discuss ongoing debates over nonprofit commercialization, and emphasize the impact of the debates on knowledge development, theory development, nonprofit practice, and public policy.

#### **Inconclusive Research Results in Nonprofit Financial Management**

Nonprofit financial management is one of the subfields in NPM that can benefit from the use of meta-analyses. Much research has been devoted to nonprofit finance since the 1980s. A variety of topics on nonprofit finance have been explored, and two prediction models have frequently appeared in the literature: the Weisbrod and Dominguez Model and the Tuckman and Chang Model. These two models substantially influence the field of nonprofit financial management.

Weisbrod and Dominguez (1986) investigated whether fundraising expenditures, organizational efficiency, and organizational reputation influenced charitable contributions to nonprofit organizations. Their model has been widely adopted by scholars to examine nonprofit donations. The studies that use the model, however, have produced conflicting results on relationships among variables. For example, some studies found that the relationship between organizational efficiency, which is measured by price, and private donations is positive (Greenlee & Brown, 1999; Gordon, Knock, & Neely, 2009).<sup>9</sup> Others found the relationship is negative (Bowman, 2006; Tinkelman, 2004), and still others found no relationship between the two variables (Frumkin & Kim, 2001; Marudas & Jacobs, 2008). The same can be said for the relationship between fundraising expenditures and donations to nonprofit organizations. Although most of the studies have identified fundraising expenditures as an advertising effect to promote nonprofit donations, the precise effects of the expenditures on different types of nonprofit organizations is still unknown (Okten & Weisbrod, 2000; Tinkelman, 2006). Specifically,

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<sup>9</sup> Although it is called organizational efficiency in the literature, it is not organizational efficiency at all.

we know the advertising effect would be different among different types of nonprofits; however, we have yet to know which types of nonprofits enjoy stronger effects and how much stronger the effects are. The Weisbrod and Dominguez Model is as follows:

$$\ln \text{DON}_i = \beta_0 + \beta_1 \ln \text{FUND}_{-1i} + \beta_2 \ln \text{PRICE}_i + \beta_3 \text{AGE}_i + \beta_4 \text{AGE}_i \times \ln \text{FUND}_{-1i} + u_i \quad (1)$$

where

$\ln \text{DON}$  is the natural logarithm of the dollar amount of contributions, gifts, and grants received by the organization.

$\ln \text{FUND}_{-1}$  is firm expenditures on fundraising in the previous period.

$\ln \text{PRICE}$  is the natural logarithm of the price of contributing a dollar of output to the firm.  $\ln \text{PRICE}$  is the proxy of organizational efficiency.

$\text{AGE}$  is the number of years the firm has existed as a nonprofit entity.  $\text{AGE}$  is the proxy of organizational reputation.

Studies that have adopted the Tuckman and Chang (1991) Model have produced mixed results as well. Tuckman and Chang (1991) used four metrics to identify financially vulnerable nonprofit organizations: equity balances, revenue diversification, administrative costs, and operating margins. Similar to the Weisbrod and Dominguez Model, studies that have employed the Tuckman and Chang Model to predict nonprofit financial health have produced inconclusive results. For example, around half of studies that examine the relationship between revenue diversification and nonprofit financial health have found that nonprofit financial health is improved by diversifying reliance on different revenue streams; however, the other half found the opposite results and suggested that revenue concentration might be better for nonprofit financial health (Carroll & Stater, 2009; Chikoto-Schultz & Neely, 2016; Greenlee & Trussel, 2000; Hager, 2001; Prentice, 2016). The similar mixed results appear in the studies that use administrative costs to predict nonprofit donations (Frumkin & Kim, 2001; Greenlee & Brown, 1999; Tinkelman & Mankaney, 2007). The Tuckman and Chang (1991) Measures are as follows:

## Equity Balances

The ratio of equities to total revenues was used as the measure of equity balances. Equities were the differences between assets and liabilities. The rationale for using this measure was the assumption that a nonprofit organization with a larger value of the relative measure had a greater flexibility to borrow funds from capital markets than those with smaller or negative values. In other words, a nonprofit organization with a smaller or negative value of the relative measure was more vulnerable than those with larger values.

$$\text{Equity Balance} = \frac{\text{Assets} - \text{Liabilities}}{\text{Revenues}} \quad (2)$$

## Revenue Sources

An index similar to the Herfindahl-Hirschman Index was applied by Tuckman and Chang (1991) to measure revenue concentration of nonprofit organizations.<sup>10</sup> The index was the

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<sup>10</sup> The Herfindahl-Hirschman Index was a measure of market concentration in economics. Tuckman and Chang (1991) used the index to measure revenue concentration of nonprofit organizations.



sum of the square of the percentage share that each revenue source divided by total revenue.<sup>11</sup> The justification of employing this measure was that a temporary decline in one revenue source might be offset by increase in other revenue sources. That is, a nonprofit organization with revenues from a single source was more vulnerable than those with equal revenues from several sources.

$$\text{Herfindahl – Hirschman Index} = \sum_{i=1}^n S_i^2 \quad (3)$$

### Administrative Costs

Tuckman and Chang (1991) used the ratio of administrative expenses to total expenses as a third measure to identify financially vulnerable nonprofit organizations. They assumed a nonprofit organization with high administrative costs was able to cut the budget without affecting program services when experiencing economic downturns. Put differently, a

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<sup>11</sup> The index was equal to 1 if a nonprofit organization receives all of its revenues from a single source. The index approached 0 if a nonprofit organization equally received all of its revenue from a variety of sources.

nonprofit organization with low administrative costs was more vulnerable than those with high administrative costs.

$$\text{Administrative Cost} = \frac{\text{Administrative Expenses}}{\text{Total Expenses}} \quad (4)$$

### Operating Margins

The ratio of net incomes to revenues was used to measure operating margins. Net incomes were the differences between revenues and expenditures. The logic behind this measure was that a nonprofit with larger net income was more likely to survive in the face of financial crises. They assumed an organization with low operating margin was more vulnerable than those with high operating margin.

$$\text{Operating Margin} = \frac{\text{Revenues} - \text{Expenditures}}{\text{Revenues}} \quad (5)$$

The rapid growth of publications in the field of nonprofit financial management over the past three decades has led to a situation in which many quantitative studies on the same topic have produced inconclusive results that have prohibited knowledge advancement. With the exception of the variables used in the Weisbrod and Dominguez Model and Tuckman and Chang Model, there are several other variables or constructs used in other models or studies producing inconclusion or contradictory results. For example, there has been a debate over the influence of commercialization on nonprofit organizations. Some empirical studies have found commercialization is beneficial to nonprofits while others have observed the opposite effect. Both opponents and proponents of nonprofit commercialization offer reasonable explanations for their arguments (Eikenberry & Kluver, 2004; Froelich, 1999; Mitchell, 2014; Weisbrod, 2004). The debate, however, has become unproductive as both sides look into different dimensions of the effects to draw their own conclusions and interpretations.

As commercialization has become ubiquitous in nonprofit scholarly research, this chapter joins a vibrant conversation in nonprofit finance research about the impact of

commercialization on nonprofit capacity and donations. The debate over whether commercialization has detrimental effects on nonprofits has been fruitfully undertaken since the 1990s but the progress in understanding the effect has been notably hampered by the lack of a rigorous and comprehensive overview. As noted by Young and Salamon (2002, p.423), “a significant commercialization or marketization of the nonprofit sector appears to be underway, although with consequences that are far from clear.” A meta-analysis to synthesize and evaluate the study findings is required.

### **The Definitions and Issues of Nonprofit Commercialization**

In the nonprofit literature, nonprofit commercialization is defined as a nonprofit’s “reliance on revenue from sales of goods and services” (Maier, Meyer, & Steinbereithner, 2016, p. 71). Examples of revenues from sales of goods and services (e.g., program service income) include nonprofit universities charging tuition fees to students, social services organizations issuing bills for health care services to clients, or arts organizations charging fees for tickets to audiences (Smith & Lipsky, 1993). The definition of

commercialization offered by nonprofit scholars, however, is narrow in the way that many other business revenues are not counted as commercial income. A broader definition of commercialization includes revenues such as investment income, royalties, rental income, sales of securities, gaming activity, and so forth (Kerlin & Pollak, 2011). Commercialization means the adoption of a variety of commercial approaches and practices to nonprofit organizations, including all kinds of commercial revenues from business activities (Drake & Rhyne, 2002; Woller, 2002). The use of the broader definition, on one hand, better reflects nonprofit commercialization; on the other hand, it makes the issue of nonprofit commercialization more complicated. For example, the questions regarding which revenues should be counted as unrelated business income and whether unrelated business income is detrimental to nonprofit organizations often become the concerns of field members (Child, 2010; Du Bois, Caers, Jegers, Schepers, De Gieter, & Pepermans, 2004; Hines Jr, 1999).

Despite the use of different definitions of nonprofit commercialization in different studies, scholars have long been interested in calculating the proportion of

commercial incomes in nonprofit revenue structures to study the trend of commercialism in the nonprofit sector and to identify the time when the sector begins to increasingly rely on commercial revenues (Guo, 2006; Kerlin & Pollak, 2011; Moulton & Eckerd, 2012).

The 1980s has long been considered as the time when commercialization in the sector took off (Gronbjerg & Salamon, 2002; Maier et al., 2016). Many have argued that multiple policy preferences in the 1980s that emphasize performance-based contract and demand-side financing have forced nonprofits to rely more on commercial revenues and to become more competitive in order to survive in the resource uncertainty environment (Smith, 2012). However, a recent work by Brown (2018) challenged the thinking that nonprofits' increased reliance on commercial revenues occurred during the 1980s. Based on his review of a series of multi-city financial reports, he concluded that the commercial trend in the nonprofit sector actually began growing significantly in the 1940s; the trend went down in the 1960s and resume in the 1980s.<sup>12</sup>

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<sup>12</sup> Brown's (2018) discussion mainly focuses on human service nonprofits.

Besides the debate over when nonprofits began to rely on commercial revenues, another line of research is concerned with the issue whether commercial revenues dominate nonprofit economics since the 1980s.<sup>13</sup> Many have argued that nonprofit organizations have increasingly generated commercial revenues to support their program services over the past decades (Anheier 2005; Frumkin, 2009; Young 1998; Young & Salamon 2002; Weisbrod, 1998). For example, Young (1998) considered commercial revenue as a “largest and fastest growing source of revenue for private, nonprofit organizations” (p.195). Anheier (2005) deemed it as “the dominant force shaping the nonprofit sector” (p.211). According to Kerlin and Pollack (2011), nonprofit commercial revenues increased by 219% from 1982 to 2002; over the same period, private donations increased by 197% and government grants by 169%.<sup>14</sup> However, in his analysis of nonprofit revenue data, Child (2010) found that there is no commercial turn in the sector; the sector overall did not change its reliance on commercial revenues in the past decades.

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<sup>13</sup> Another debate centers around the association between the increases in commercial revenues and decreases in either government funding and private donations (Kerlin & Pollack, 2011).

<sup>14</sup> Note that Kerlin and Pollack (2011) used the IRS Statistics of Income (SOI) data files and excluded hospitals and higher education organizations in their calculations.

Although the debate over whether the nonprofit sector has increasingly relied on commercial revenues has triggered many different responses, no scholars refute the fact that commercial revenues have played an indispensable role of nonprofit organizations and further ask the question about whether commercialization is beneficial to nonprofit organizations. In the following section, I focus the discussion on the debate between two camps over the effect of commercialization on nonprofit organizations followed by a nuanced theoretical treatment of nonprofit commercialization.

### **The Ongoing Debate over the Effect of Commercialization on Nonprofit Organizations**

With the importance of commercial revenues to nonprofit organizations, scholars have been asking a question raised by Weisbrod (1998) twenty years ago: “can nonprofits simultaneously emulate private enterprise and yet perform their social missions?” (p.12). Many scholars have given a pessimistic view of nonprofit commercialization. For example, in response to the question, Weisbrod (2004) argued that nonprofits must be



pure. Instead of seeking commercial opportunities to support its program services, nonprofits should rely on government funding and private donations to ensure the quality of their services. In other words, no commercial activities are encouraged to get involved in nonprofit program services (James, 1998). Commercial revenues, in some cases, are found to crowd out private donations or government funding, making nonprofits financially vulnerable (Guo, 2006; Kingma, 1995; Stone, Hager, & Griffin, 2001; Yetman & Yetman, 2003). In addition, Eikenberry and Kluver (2004) and Eikenberry (2009) echoed Weisbrod (2004) and contended that adopting commercial strategies harms nonprofits' ability to maintain a strong civil society since nonprofit organizations' roles as value guardians, service providers and advocates, and social capital builders are easily affected by commercialization.

Proponents of nonprofit commercialization, however, have offered different perspectives that contradict and complicate the arguments and findings of the opponents.<sup>15</sup> First, they have claimed that commercial activities do not necessarily lead to

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<sup>15</sup> Nuanced treatment of the advantages and disadvantages of nonprofit commercial revenues is discussed in

mission drift. The activities are typically related to nonprofits' missions (Froelich, 1999). Unrelated business income in nonprofits remains low over time (Child, 2010). Second, they have argued that commercial programs serve as a means for nonprofits to be self-sufficient and to manage its dependencies with external resources providers (Froelich, 1999; Mitchell, 2014). The autonomy, in turn, enables nonprofits to flexibly initiate new social programs and quickly adapt to external environments (Froelich, 1999; Gras & Mendoza-Abarca, 2014). Third, they have contended that in the face of environment uncertainty, commercial revenues act as a cushion to prevent nonprofits from ceasing to deliver services, especially when funding from governments and donors are unstable (LeRoux, 2005; Tuckman and Chang, 1991). Fourth, fee-charging in the nonprofit sector has been considered "as a potential vehicle for communal inclusiveness" (Brown, 2018, p. 976). Finally, scholars have found that commercial revenues, in some cases, crowd in private donations (Okten & Weisbrod, 2000; Posnett & Sandler, 1989; Wicker, Breuer, &

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the next section. Theoretically speaking, I would identify this as a debate between nonprofit autonomy (resource dependence theory) and legitimacy (institutional theory). One emphasizes the importance of organizational flexibility; the other stresses the importance of organization legitimacy. Both flexibility and legitimacy are vital elements for nonprofit organizations to survive financially and socially.

Hennigs, 2012). The ongoing debate over nonprofit commercialization reflects a need for a study to make the divisive debate more manageable and productive.

The reason why nonprofit commercialization arouses considerable scholarly debate is because it is related to multiple significant policy considerations and value system in society. The most widespread concern lies in whether vulnerable and disadvantaged people are able to pay for social services if the nonprofit sector becomes increasingly commercialized (Backman & Smith, 2000). Being unable to provide services to those in need raise questions regarding the sector's role as public and social services providers. Moreover, the increasing commercialization trend in the nonprofit sector has led to a situation in which many for-profit firms find themselves under pressure to compete with nonprofit organizations. Some of them deem it as an unfair competition and urge the revocation of nonprofits' tax-exemption status (Bennett & DiLorenzo, 1989). Most importantly, agency problem, which refers to a conflict of interest between a nonprofit's management and the organization's stockholders, has been found to be related with nonprofit unrelated business income (Du Bois, et. Al., 2004). As a result,

commercialization might be identified with rent-seeking behavior rather than prosocial behavior, which is against the value that the sector pursues.

### **Theoretical Perspectives of Nonprofit Commercialization**

Scholars have proposed and used different theories to explain nonprofit commercialization. Of the theories discussed, resource dependence theory and institutional theory are widely applied to nonprofit commercialization research.

#### **Resource Dependence Theory**

Resource dependence theory (RTD) centers around power in and around organizations and looks at how organizations use power to manage their dependence on uncertain environments and with critical resources providers (Davis & Adam Cobb, 2010; Pfeffer & Salancik, 1978). Organizations that are able to increase their power over other organizations through reducing others' power over them are more likely to survive and thrive in a changing and evolving environment (Ulrich & Barney, 1984). Build on Pfeffer and Salancik (1978), Casciaro and Piskorski (2005) argued that organizational interdependence can be better understood through two dimensions: power imbalance and mutual dependence. On the basis of their studies, they proposed two strategies for organizations to manage dependence: power-use strategy and power-restructuring strategy. The decision of which strategy to use is based on power structure among organizations.

Power-use strategy is mainly employed by power-advantaged organizations to offer collaboration opportunities between two parties when power imbalance between power-advantaged and power-disadvantaged organizations is high and mutual dependence

between the two is high (Casciaro and Piskorski, 2005). This strategy requires two parties to agree. It is a bilateral strategy, and more likely to be initiated by power-advantaged organizations. However, power-advantaged organizations, sometimes, lack incentives to offer the collaboration opportunities because they might lose their discretion over the allocation of their critical resources to power-disadvantaged organizations once the collaborations are formed.

Power- restructuring strategy is mainly employed by power-disadvantaged organizations when power imbalance between power-advantaged and power-disadvantaged organizations is high and some degree of mutual dependence exists between the two parties (Casciaro and Piskorski, 2005). This strategy does not require two parties to agree. It is a unilateral strategy. It has been used by power-disadvantaged organizations to seek autonomy from power-advantaged parties. Power-disadvantaged organizations obtain autonomy by reducing the interest in critical resources offered by power-advantaged organizations and/or cultivating alternative sources from external environments. Nonprofits that rely on power-advantaged organizations or individuals to

provide critical resources often use power-restructuring strategy to seek their autonomy and then ensure their survival.

Revenue diversification is regarded as a power- restructuring strategy for nonprofits to manage their dependencies with other individuals and organizations that control critical resources (Gras & Mendoza-Abarca, 2014). Specifically, the strategy is about how nonprofits diversify revenue streams through increasing the proportion of commercial incomes in their revenue structure (Casciaro & Piskorski, 2005; Froelich, 1999; Gras & Mendoza-Abarca, 2014; Hager, 2001; Mitchell, 2014). Commercial revenues combined with government support and private donations are expected to stabilize nonprofits' financial conditions and enhance their survivability (Froelich, 1999; Gras & Mendoza-Abarca, 2014; Hager, 2001; Young, 1998). A decrease in government support to a nonprofit might be offset by an increase in the amount of program service fees that it charges its clients. The increase in commercial revenues is associated with strong financial capacity and sustainability (Hung & Hager, 2018). The revenue

diversification strategy, which emphasizes revenue balance, ensures nonprofits to accomplish social missions in an unstable resource market (Carroll & Stater, 2008).

Another line of argument favors dependence-avoidance strategy that emphasizes the importance of keeping nonprofits' away from government grants and private donations through the development of commercial revenue streams: autonomy (Gras & Mendoza-Abarca, 2014). Governments and private donors are deemed as dominant stakeholders who have legitimacy and power over nonprofits (Gras & Mendoza-Abarca, 2014). These traditional funding sources always impose certain requirements on nonprofits. The requirements sometimes limit nonprofits' usage of the funding sources to specific social services. In contrast, commercial revenues bring nonprofits autonomy and flexibility (Gronbjerg, 1991). Also, commercial revenues are deemed as a means to nonprofit sustainability as government or private funding sources are easily cut back (Foster & Bradach, 2005). The dependence-avoidance strategy that advocates commercial revenues allows nonprofits to freely create programs, enabling the



organizations to quickly adapt to changing environments (Froelich, 1999; Gras & Mendoza-Abarca, 2014).

Market mechanism, although not preferred by many nonprofit professionals, brings the nonprofit sector efficiency and competition that might enhance nonprofits' ability to effectively deliver social services (Child, 2010; Young & Salamon, 2002; Oster, 1995). Many management concepts used in the for-profit sector have been increasingly adopted by nonprofits. For example, the terms "market niche" and "strategic planning" have been commonly mentioned by nonprofit professionals and seen in the nonprofit literature. Also, many nonprofits actively engage in performance measurement aimed at contributing to better program services (Young & Salamon, 2002). Most importantly, nonprofits that rely on commercial revenues are found to be more likely to manage its financial resources efficiently when compared to nonprofits that rely primarily on donations (Ecer, Magro, & Sarpça, 2017); it is a claim frequently made by consultants and private funders (Toepler, 2006).

Moreover, predictable revenue streams are more likely to be created through commercial activities. Program services enable nonprofits to “develop long-term client relationships, seek high proportions of repeat clients, focus on fiscally competent clients, and pursue organizational rather than individual clients” (Gronbjerg, 1992, p.79). The predictability reduces revenue uncertainty and increase organization survivability (Gronbjerg, 1992). Also, commercial revenues serve as a signal to competent people who are interested in nonprofit jobs (Ecer, Magro, & Sarpca, 2017; Guo, 2006; Young & Salamon, 2002). Moreover, commercialization enhances nonprofits visibility that brings more customers, donors, and volunteers into organizations (McManus & Bennet, 2011; Smith, 2009).

### **Institutional Theory**

Institutional theorists have proposed that organizations are influenced by normative pressures that arise from either external sources or within the organization itself.

Organizations, under certain conditions, are guided by the normative pressures that force

organizations to follow standard operating procedures, to obtain professional certification, and to meet state requirements. Organizations that adopt the legitimated elements become isomorphism within the institutional environment, increasing their likelihood of survival although their organizational performance might deteriorate (Baum & Oliver, 1991; DiMaggio, 1988; DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Meyer, Rowan, & Scott, 1983; Oliver, 1991; Zucker, 1987).

DiMaggio and Powell (1983) proposed that there are three ways that institutional processes affect organizations. (1) coercive processes: organizations that are subject to state legitimation, licensing, or accreditation; (2) normative processes: organizations that are subject to associations of peer organizations; and (3) mimetic processes. organizations that are subject to the performance of other organizations. Conformity to the institutional pressures might increase organizations' resource flows and survival chances (e.g., obey government regulations, obtain accreditations from industry associations, and copy the strategies of competitors); however, organizations' efficiency and autonomy are likely to be threatened (DiMaggio & Powell, 1983; Zucker, 1987).

From the perspective of institutional theory, nonprofit organizations better meet expectations of their stakeholders. Many stakeholders are concerned with whether mission drift occurs when nonprofits exploit commercial revenue opportunities or when nonprofits overestimate the importance of commercial revenue streams (Dees, 1998; DiMaggio, 1986; Froelich, 1999; Gronbjerg, 1993; Salamon, 1993; Toepler, 2001; Weisbrod, 2004; Young & Salamon, 2002). For example, market-driven nonprofits might continue providing social services only when the social programs are profitable (Eikenberry & Kluver, 2004). Instead of putting effort in maintaining the social missions of the organizations, they strive to pursue financial benefits not expected by their constituents. A principal-agent issue might arise because of mission drift; the issue, in turn, puts nonprofit survivability at risk. Once stakeholders have concerns about commercialization, their support to nonprofit organizations might decrease. While the concern is widespread, it is important to note that Jones (2007) held a different view on this matter and argued that all kinds of funding sources, rather than merely commercial revenues, can lead to nonprofit mission drift.

Another concern with the development and reliance of commercialization is that nonprofits might lose trust and legitimacy among its stakeholders (Dees, 1998; Eikenberry & Kluver, 2004; Froelich, 1999; Weisbrod, 2004; Young & Salamon, 2002).<sup>16</sup> Nonprofits are expected by its stakeholders to represent public interest and value. Nonprofits' close relationships with its stakeholders are built upon the degree to which the stakeholders believe that nonprofits are able to mobilize collective action and tackle social problems (Eikenberry & Kluver, 2004). The good relationships might deteriorate when nonprofits start shifting their attentions to commercial strategies and revenues that devalue its work among the stakeholders. In other words, marketization makes nonprofits fail to maintain trustworthy reputation (Eikenberry & Kluver, 2004).<sup>17</sup> Stakeholders are not merely concerned with what nonprofits do is legal, they are more eager to know whether nonprofits do the "right" things (Hodgkin, 1993). Nonprofits put

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<sup>16</sup> "Legitimacy is a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs and definitions" (Suchman, 1995, p. 574).

<sup>17</sup> Marketisation in nonprofits refers to "more market driven, client driven, self-sufficient, commercial or business like" (Dart 2004, p.414)

their long-term survival in danger if they lose support from their stakeholders (Eikenberry & Kluver, 2004; Hager, Galaskiewicz, & Larson, 2004).

Moreover, nonprofits are not expected by some donors to behave businesslike (Dees, 1998).<sup>18</sup> Some studies found donors penalize nonprofits with commercial revenues (Kingma, 1995; James, 1998). That is, commercial revenues crowd out private donations; donors treat commercial revenues as substitutes for charitable giving (McManus & Bennet, 2011; Smith, 2009; Yetman & Yetman, 2003). Others, however, demonstrate that the relationships between the two variables are mixed, with only some types of nonprofits (e.g. housing and arts organizations) show negative relationships (Segal & Weisbrod, 1998). Herman and Rendina (2001) delved into this question through a case study and suggested that relatively few donors would make giving decisions based on whether nonprofits have commercial revenues. However, donors' aversion to nonprofits appears when they acknowledge that the commercial programs do not advance nonprofit social missions. In short, nonprofits take risks of losing donors when embracing commercial

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<sup>18</sup> Dart (2004) provides topology of "business-like" in nonprofit organizations.

revenues, especially unrelated business income. Also, the trade-off between private donations and commercial revenues makes revenue strategies complicated.

Last, not related to institutional theory but important, is that some even doubt that nonprofits are capable of coping with market risks and performing efficiently, profitably, and innovatively (Dees, 1998; Eikenberry, 2009; Foster & Bradach, 2005; Frumkin & Andre-Clark, 2000). Nonprofits do have several advantages over for-profit organizations in competitive markets. For instance, they are tax-exempt from federal corporate income taxes and some of them are volunteer-supported organizations. However, this does not necessarily mean nonprofits would survive in the markets (Dees, 1998). Only relying on board members and consultants with management expertise is not sufficient. It takes time for internal staff to excel in business management and strategies. Without the knowledge and skills from internal staff to sail commercial waters, nonprofits are very likely to fail on campaigns with their for-profit counterparts (Dees, 1998; Frumkin & Andre-Clark, 2000). In their interviews with 41 nonprofits, Foster and Bradach (2005) find around 70% of the nonprofits are not profitable. Walking into the commercial world, nonprofits

already face the market difficulties, not to mention culture conflicts that might occur in the organizations (Dees, 1998; Frumkin & Andre-Clark, 2000).

### **A Literature Review on Nonprofits Being Business-Like**

The discussion of the theoretical perspectives of nonprofit commercialization reveals the fact that scholars are increasingly concerned with the topic of nonprofit commercialization, and the fact that research has explored the topic from different perspectives and have examined the effect of nonprofit commercialization in different ways. A recent literature review systematically summarized this line of research in a border way (Maier et al., 2016). Instead of reviewing literature on nonprofit commercialization, Maier et al., (2016) looked at nonprofit commercialization in a holistic way and mapped the knowledge status of business-like nonprofits. They noted that multiple similar but distinct concepts of business-like nonprofits have emerged in the literature as the topic has been widely studied by scholars. A business-like nonprofit is defined as an organization that has established itself as a serious believer in



commercialization, managerialization, and/or professionalization. However, they found that these concepts have been loosely defined in the literature.

Following Dart (2004), Maier et al., (2016) analyzed business-like nonprofits from three dimensions: business-like organization, business-like goals, and business-like rhetoric. Under this analysis framework, Maier et al., (2016) disentangled different definitions of business-like nonprofits and their implications for nonprofit management. Specifically, after defining a number of terms relevant to business-like nonprofits (e.g., commercialization, managerialization, and professionalization), Maier et al., (2016) shifted their attention to the questions of the causes of nonprofits becoming business-like, organizational structures and processes of becoming business-like, and effects of becoming business-like. Their analysis builded a basis for future research. However, similar to other traditional literature reviews, their work suffers from two main limitations discussed in Chapter 1: parsimony and precision.

A literature review makes a contribution to knowledge advancement when the review makes its analyses parsimonious and results precise. However, this is not the case in Maier et al.,'s (2016) review. First, Maier et al., (2016) clarified different concepts of business-like nonprofits, making the differences among the key concepts clear. However, the discussion becomes obscure when they move onto the broader agenda of business-like nonprofits where they write about the causes and effects of business-like nonprofits, organizational structures, and organizational processes. For example, when it comes to the effects of business-like activities, several dimensions could be considered. Based on the existing literature, Maier et al., (2016) discussed the effects of business-like on a variety of dimensions: performance, programmatic services, power, knowledge, & subjectivities, and legitimacy. The holistic inclusion of the dimensions undoubtedly facilitates our understanding of existing literature; however, the inclusion of such a broad range of research also prohibits them from drawing meaningful conclusions from the analysis, which in turn hinders knowledge advancement.

Secondly, similar to other traditional literature reviews, Maier et al., (2016) review is not able to make precise conclusions on many research questions. For instance, a part of their discussion focused on the causes of nonprofits becoming business-like. They grouped the literature into three categories: exogenous causes, endogenous causes, and causes at the organization/environment interface. After briefly reviewing the literature on the causes, they concluded that “theories are well developed, qualitative as well as quantitative studies abound, and they connect to wider research streams from various disciplines” (p.78). They, then, suggested that fewer research efforts are needed to be devoted to understating the causes of nonprofit being business-like and more research efforts are needed to determine what are the structures and processes of becoming business-like nonprofits and what are the effects of becoming business-like. The problem is that that part of the discussion on the causes of nonprofits being business-like forms an impression of including a number of studies without reaching any meaningful or precise conclusion. Through the review, we know what has been done on the topic; however, we do not know their research findings, not to mention conclusions drawing from the findings.

Meta-analyses can fill the gaps left by traditional literature reviews. A group of research questions discussed by Maier et al., (2016) can be sliced into several individual pieces of meta-analysis for more parsimonious analysis and precise conclusions once the number of quantitative studies on each research question is sufficient. Instead of using a big concept such as nonprofit business-like, more manageable analysis could be centered around commercialization, managerialization or professionalization. Moreover, instead of putting causes, effects, and other considerations into a review, more precise conclusions could be obtained from focusing on one dimension. In the following chapter, I use the effect of commercialization on nonprofit capacity and donations as an example to illustrate how meta-analysis complements the traditional literature review by offering more parsimonious analysis and precise conclusions.

## CHAPTER 3

### NONPROFIT COMMERCIALIZATION META-ANALYSIS

This chapter uses nonprofit commercialization as an example of meta-analysis to examine its impact on nonprofit organizations. The purpose of this chapter is to demonstrate how meta-analysis contributes to knowledge aggregation and facilitates knowledge advancement.

#### **Research Methods**

In the following sections, I conduct two meta-analysis. The first one examines the relationship between commercialization and nonprofit capacity; the second one examines the relationship between commercialization and nonprofit donations. The second one is a subgroup analysis of the first one. Following the six-stage process of conducting a meta-analysis introduced in Chapter 1, I demonstrate how the use of meta-analysis can make the heated debates more manageable and productive.

## **Formulating a Research Question**

The debate over whether commercialization has detrimental effects on nonprofits offers little resolution. The debate is not able to be settled with more empirical studies. The mixed results in the literature not only hinder knowledge advancement, but also puzzles nonprofit professionals, policy makers, and researchers as to whether nonprofits should embrace commercial activities. Meta-analyses serve as a valuable tool to synthesize the current state of knowledge, advance our understanding of nonprofit commercialization, and provide guidelines for nonprofit financial management and policy formulation. Specifically, meta-analysis, first, offers a weighted average effect size to summarize the relationship between commercialization and nonprofit capacity (or donations). Then, it explains the variation in effect sizes. For example, it could disentangle the average effect size of taxable commercial revenues from that of tax-exempt commercial revenues and examine whether the former ones are more detrimental

to nonprofit organizations. The same logic can be extended to the investigation of different types of nonprofit capacities.

### **Identifying Relevant Studies**

I employ guidance on the literature searches and reality checks suggested by Card (2012), Lipsey and Wilson (2001), and Ringquist (2013) in sample selection. First, I searched three academic platforms/databases for relevant studies: EBSCOhost, Social Sciences Citation Index citation (SSCI), and ProQuest. EBSCOhost is a research platform that provides access to a collection of databases for the arts, business, education, health and medicine, history, literature and language, science and technology, and social sciences research. SSCI provides access to more than 3,000 social sciences journals across more than 50 disciplines. As with EBSCOhost, ProQuest is a platform that provides a collection of academic databases. The availability of a variety of databases across a wide range of disciplines fits the interdisciplinary nature of nonprofit studies published in various journals. Also, both EBSCOhost and ProQuest platforms include

databases that contain unpublished studies, such as dissertations and theses, reports, and conference papers that are necessary to accurately estimate effect sizes and to further examine publication bias in meta-analyses.

Before searching the databases for relevant studies, I define the terms *commercialization* and *nonprofit capacity* (and donations) in order to further generate search strings for sample selection. Maier et al., (2016) defined commercialization as “reliance on revenue from sales of goods and services” (p. 71). This definition primarily focuses nonprofit commercial activities on program services revenues. Many studies have been using this definition to look at the trend of commercialization in the nonprofit sector (Brown, 2018; Child, 2010; Cordes & Weisbrod, 1998). However, another group of studies defines nonprofit commercialization as the adoption of a variety of commercial approaches and practices to nonprofit organizations and include all kinds of commercial revenues from commercial activities, such as include investment income, royalties, rental income, sales of securities, gaming activity, and so forth, to examine nonprofit commercialization (Drake & Rhyne, 2002; Woller, 2002). They have argued that



nonprofit commercialization should be broadly defined (Kerlin & Pollak, 2011; Salamon, 1993). In this study, I adopt the latter view, and the definitions of different types of commercial revenues provided by the Internal Revenue Service are listed as follows.<sup>19</sup>

### Program Service Revenue

*Program service revenue includes income earned by the organization for providing a government agency with a service, facility, or product that benefited that government agency directly rather than benefiting the public as a whole. Program service revenue also includes tuition received by a school, revenue from admissions to a concert or other performing arts event or to a museum; royalties received as author of an educational publication distributed by a commercial publisher; interest income on loans a credit union makes to its members; payments received by a section 501(c)(9) organization from participants or employers of participants for health and welfare benefits coverage; insurance premiums received by a fraternal beneficiary society; and registration fees received in connection with a meeting or convention.*

### Investment Income

*Interest income from savings and temporary cash investments, dividend and interest income from equity and debt securities (stocks and bonds), amounts received from payments on securities loans, as defined in section 512(a)(5), as well as interest from notes and loans receivable.*

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<sup>19</sup> Please see Instructions for Form 990 Return of Organization Exempt from Income Tax for more detail, available at <https://www.irs.gov/pub/irs-pdf/i990.pdf>

## Income from Investment of Tax-Exempt Bond Proceeds

*Investment income actually or constructively received from investing the proceeds of a tax-exempt bond issue, which are under the control of the organization.*

## Royalties

*Royalties received by the organization from licensing the ongoing use of its property to others. Typically, royalties are received for the use of intellectual property, such as patents and trademarks. Royalties also include payments to the owner of property for the right to exploit natural resources on the property, such as oil, natural gas, or minerals.*

## Rental Income

*Rental income received for the year from investment property and any other real property rented by the organization.*

## Sales of Securities

*Sales of all other types of investments (such as real estate, royalty interests, or partnership interests) and all other non-inventory assets (such as program-related investments and fixed assets used by the organization in its related and unrelated activities).*

## Income from Fundraising Events

*Organization's gross income from fees, ticket sales, dinners/dances, door-to-door sales of merchandise or, concerts, carnivals, sports events, auctions, and other revenue from fundraising events.*

## Gaming Activity

*Types of gaming include, but aren't limited to: bingo, pull tabs, instant bingo, raffles, scratch-offs, charitable gaming tickets, coin-operated gambling devices, and so forth.*

## Sales of Inventory

*Sales of items that are donated to the organization, that the organization makes to sell to others, or that it buys for resale. Sales of inventory don't, however, include the sale of goods related to a fundraising event.*

Nonprofit capacity is referred to an organization's "ability to perform work" (Yu-Lee, 2002, p.1). In the nonprofit context, nonprofit capacity indicates a nonprofit's ability to fulfil its missions (Eisinger, 2002; Letts, Ryan, & Grossman, 1999). As commercialism in the nonprofit sector becomes prevalent, nonprofits are constantly growing their commercial strategies and creating new business programs to support their social and public services. Therefore, the term nonprofit capacity is no longer restricted to programmatic capacity that emphasizes social mission delivery. Instead, it covers both programmatic capacity and financial capacity, stressing a nonprofit's ability to meet its double bottom line (Chetkovich & Frumkin, 2003; Eikenberry, 2009; Sanders &

McClellan, 2014; Young, Jung, & Aranson, 2010). So, in this dissertation, I define nonprofit capacity as a nonprofit's ability to fulfill social mission (programmatic capacity) and maintain financial health (financial capacity). Programmatic capacity indicates a nonprofit's ability to fulfill social mission. The capacity can be measured through a variety of proxies or indicators. For example, a museum's programmatic capacity can be measured either by the total museum attendance or by the museum's expenditures on program services. On the other hand, financial capacity indicates a nonprofit's ability to maintain financial health. The capacity can be measured by a variety of indicators that reflect a nonprofit's financial conditions. These indicators include donations, financial efficiency, financial vulnerability, financial stability, financial volatility, and assets.

The keywords chosen to search for relevant studies reflect the content of the definitions. Specifically, I use the following search strings for preliminary sample selection: (nonprofit OR not-for-profit OR non-profit) AND (earned income OR earned revenue OR commercial income OR commercial revenue OR commercial activity OR

program service revenue OR unrelated business income) AND (capacity OR performance OR vulnerability OR stability OR efficiency OR effectiveness OR outcome OR output OR mission OR survival OR donation OR contribution OR giving). The database searches yield 429 candidate studies (Table 2).

Table 2.

*Database Search Results*

Databases	Number of Candidate Studies
EBSCO	99
SSCI	101
ProQuest	326
Duplicate Articles	97
Total	429

Note: Search Date: 1/6/2018

Secondly, although EBSCOhost and ProQuest platforms include unpublished studies, I search programs of nonprofit-related academic conferences (e.g., Association

for Research on Nonprofit Organizations and Voluntary Action, International Society for Third-Sector Research, American Society for Public Administration, and West Coast Nonprofit Data Conference), and archives of working papers (e.g., Social Science Research Network and National Bureau of Economic Research) for more relevant grey literature. I contacted authors for conference presentations not archived online. The purpose of including grey literature in the meta-analysis is to reduce estimation bias. Many research studies are not able to be published because their results do not show a statistically significant finding. The problem is that not being able to demonstrate statistically significant findings does not mean that the results are incorrect. Instead, the results might indicate a true relationship between variables of interest among a particular group of individuals or organizations. Excluding these nonsignificant studies might lead to the overestimation of effect sizes investigated. Ringquist (2013) warned that the bias issue is more likely to occur in the field of public management and policy where many studies are conducted by think tanks, government agencies and policy research firms.

Third, I performed backward searching that involves reviewing bibliographies of candidate studies selected via academic database, conference program, and working paper searches for references to other potential candidate studies. Fourth, I performed forward searching to search for later studies that cite the candidate studies. In my case, I used Google Scholar to do forward searching. In addition, I conducted two reality checks. First, I skim online tables of contents of four leading nonprofit study journals, *Nonprofit and Voluntary Sector Quarterly*, *Nonprofit Management & Leadership*, *Voluntas*, and *Public Administration Review*, to ensure that no relevant studies are being left out. Next, I use Google Scholar to search for articles not collected through the previous searches. All these efforts are to ensure the literature listed as complete as possible. These searches yield an additional 163 candidate studies (Table 3). All of the searches yield 592 candidate studies (429 + 163 = 592) in total.<sup>20</sup>

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<sup>20</sup> The search time frame was not limited was not limited. Any paper that is published before September 30, 2018 and is related to the topic is included in this meta-analysis.

Table 3.

*Other Search Results*

Approaches	Number of Candidate Studies
Backward Searches	84
Forward Searches	30
Others	49
Total	163

Note: Search Date: 9/30/2018

However, not all candidate studies can be included into the meta-analysis. The decision of which original studies will be included and excluded is based on the criteria listed below. First, I include studies that estimate relationships between commercialization and nonprofit capacity. Studies that investigate curvilinear relationships of the variable are excluded since meta-analyses are not able to examine the relationship (e.g., Gras & Mendoza-Abarca, 2014). Second, commercialization in this study is defined as nonprofits' adoption of a variety of commercial approaches and practices. I, therefore, include studies that use any kind of commercial revenues as the



measures of commercialization. However, those studies (e.g., Feiler, Wicker, & Breuer, 2015; Guo, 2006; Kara, Spillan, & DeShields, 2004) that use people's perceptions of nonprofit commercialization are not included in this study. Third, the same can be said for the measurement of nonprofit capacity. I only include studies that measure nonprofit financial and programmatic capacity in a countable way. Therefore, studies (e.g., Thompson & Williams, 2014) that use participants' perceptions of organizational performance as dependent variables to examine the impact of commercialization on nonprofit organizations are excluded. Fourth, although studies that use regression models always have an endogeneity problem, the problem is most severe in simple regression models. Thus, I excluded studies that use simple regression models to estimate the relationships between the two variables. Fifth, I exclude quantitative studies that do not provide sufficient information to calculate effect sizes and to code study background and information statistics (Bennett, Iossa, & Legrenzi, 2010). Sixth, I exclude studies not written in English. Seventh, merely including published studies might over-estimate the relationship between the two variables; therefore, I include both published and unpublished studies to reduce the bias. Finally, I include studies that sample in and across

all countries. There are 42 articles that meet these criteria. Of the 42 articles, 36 are published studies and 6 are unpublished studies. The procedure also yields 545 effect sizes from the 42 articles since most of the articles produce more than 1 effect size. Of the effect sizes, 215 effect sizes indicate positive associations; 53 effect sizes indicate null association; 230 effect sizes indicate negative associations.

The selected studies can be categorized into three categories. Studies that directly investigate the relationship between commercialization and nonprofit capacity are grouped into the first category. They are studies that either clearly state in their title or abstract that they test the relationship or explicitly examine the relationship in their regression models (Category 1). Second, studies that examine the interactions among private donations, government grants, and commercial revenues are included. Most of these studies test crowd-in or crowd-out effects among the revenues (Category 2). For example, they test whether commercial revenues crowd out private donations. It can be understood as whether commercialization has a negative impact in nonprofit financial capacity. Finally, studies that investigate whether government grants crowd out private

donations and include commercialization revenues as (a) independent variables are included in the analysis (Category 3). Studies in Category 3 are very similar to studies in Category 2 in the way that they use the same model specifications. However, studies in Category 3 focus on different independent variables from studies in Category 2 when interpreting model results. The number of studies grouped into each category is listed as follows (Table 4). A list of the studies can be found in Appendix A.

Table 4.

*Relevant Articles for the Meta-Analysis by Category*

Category	Number of Relevant Studies
1	19
2	16
3	7

**Coding Data**

I conduct two meta-analyses in this chapter; one looks at the relationship between commercial revenues and nonprofit capacity (Figure 3), the other focuses on the relationship between commercial revenues and donations (Figure 4). Data for the meta-analysis of the relationship between commercial revenues and nonprofit capacity come from the 42 selected studies. Of the 42 studies, 25 of which focus on the relationship between commercial revenues and nonprofit donations. These 25 studies are used for the second meta-analysis in this chapter. I code three different types of information from the studies. First, I collect and code data that are related to study background information, such as authors, publication year, sample size, and so forth. Second, I code statistics that can be used to calculate effect sizes. These statistics include, but are not limited to, parameter estimates, standard errors, t-statistics, Wald-statistics, statistical significance levels, and so on. Finally, I code information that might be useful for translating into moderators that can be further used to explain the variation in effect sizes. The information includes the difference in measurements, model specifications, variable definitions, and other study characteristics. A meta-analysis database is built after all

information is collected and coded. In the following two sections, I discuss how to calculate effect sizes and which moderators are selected for the meta-regression analyses.

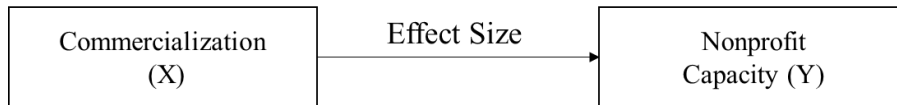


Figure 3. *The Relationship between Commercial Revenues and Nonprofit Capacity*

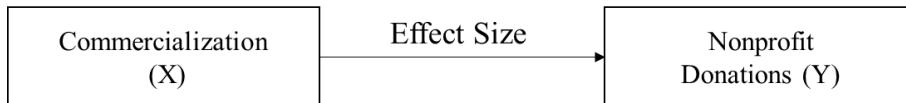


Figure 4. *The Relationship between Commercial Revenues and Nonprofit Donations*

### **Calculating Effect Sizes**

I use Pearson's correlation coefficients ( $r$ ) as the index of effect sizes to measure the relationships between commercialization and nonprofit capacity (and donations) across studies. I use statistics, such as t-statistics or Wald-statistics, reported in the original studies to calculate  $r$  when correlation coefficients are not reported in the studies.

These two statistics are readily available in many of the original studies. Some of the original studies do not provide the statistics; however, they report parameter estimates and standard errors that can be used to calculate t-statistics or Wald-statistics.

Corresponding t-statistics are used to compute r effect size when the original studies report a statistically significant relationship and parameter estimates, but not standard errors. In addition, I record r effect sizes as zero when the original studies report a null relationship, but do not report standard errors. Moreover, I use standardized regression coefficient estimates as r if the original studies only report standardized  $\beta$ . A table that summarizes these coding approaches is as follows (Table 5).

Table 5.

*Effect Size Calculation Approaches*

Approaches	Detail
1	if an original study reports correlation coefficient, then $r = r$
2	if an original study reports t-statistics, then use t-statistics to calculate r
3	if an original study tests hypothesis using Wald tests, then use $\chi$ to calculate r
4	if an original study estimates models using maximum likelihood, then use Z-statistics to calculate r
5	if an original study does not report t-statistics, Z-statistics, or $\chi$ , but reports parameter estimates and standard errors, then use the estimates and errors to calculate statistics and r
6	if an original study only reports parameter estimates (no standard errors reported), and identify statistically significant parameter estimates using asterisks or other symbols, then set the t-score equal to the value of t at the symbol threshold and given degrees of freedom to calculate r
7	if an original study only reports that parameter estimate of interest is not statistically significant, then code $r = 0$
8	if an original study reports standardized regression coefficient estimate $\beta_j$ , then $r = \beta_j$

Note. These approaches are suggested by Ringquist (2013) p.105-109

Once effect sizes, correlation coefficients  $r$ , for each study are calculated, I combine the effect sizes to produce a weighted average effect size across the studies. This average effect size is the estimate of overall relationship between commercialization and

nonprofit capacity (and donations). It is worth mentioning that meta-analyses do not give all effect sizes identical weight when synthesizing them into an average effect size. Instead, meta-analysis techniques give greater weight to more precisely estimated effect sizes. The precision is dependent on effect size variation. Large sample studies are given greater weight since they have less variance and are, in general, more precise. The formulas used to compute the weighted effect size can be found in Appendix C. Although I calculate an average effect size and claim that this effect size represents an overall relationship between the variables of interest, “the assumption that individual effect sizes represent quantities that are similar enough” is not easy to be satisfied for research in the field of nonprofit and public management where studies frequently use different operationalizations of key concepts, distinct research designs, and various regression models (Ringquist, 2013, p.127). This suggests that meta-analyses in NPM should pay more attention to the results of meta-regression analyses designed to explain the variation in effect sizes.

### **Meta-Regressions and the Selection of Moderators for Meta-Regression Analyses**



Meta-regression analyses aim to explain the variation in effect sizes across studies. Moderator choices should be based on theoretical perspectives, measurement, research designs, publication bias, data structures, data sources, model specifications, organizational types, and so forth. Moderators could be binary, dummy or continuous variables. For example, in this study, I am concerned with whether original studies that focus on financial capacity report more positive effect sizes than original studies that center on programmatic capacity. The selection of this moderator is based on the theoretical argument that commercialization would be beneficial to nonprofit financial capacity since it enables nonprofits to quickly adapt to changing environments without being financially vulnerable (Froelich, 1999; Gras & Mendoza-Abarca, 2014); however, it might be harmful to nonprofit programmatic capacity since it leads to mission drift (Dees, 1998; DiMaggio, 1986; Froelich, 1999; Gronbjerg, 1993; Salamon, 1993; Toepler, 2001; Weisbrod, 2004; Young & Salamon, 2002). In this case, I create a binary moderator and code studies that measure nonprofit financial capacity as 1 and

programmatic capacity as 0. Overall, in this study, I consider 10 independent variables (moderators) to examine the variation in effect sizes.

**Nature of nonprofit capacity measure.** Nonprofit capacity is a multidimensional construct. Basically, the construct can be delineated from two domains: *financial capacity* and *programmatic capacity*. The influence of commercialization on these two capacities is complicated. While successful commercialization strategies bring financial resources into nonprofits for fundraising activity and make nonprofits financially healthy, some donors penalize nonprofits that get involved in commercial activities, which in turn leads to the decrease in donations and nonprofit financial capacity (James, 1998; Kingma, 1995; McManus & Bennet, 2011; Smith, 2009). The interaction between these two forces makes the relationship between commercialization and nonprofit financial capacity difficult to predict. The same can be said about the relationship between commercialization and nonprofit programmatic capacity. On one hand, revenues from commercial activities allow nonprofits to flexibly create new and more programs to carry out social services; on the other hand, commercialization is also very likely to drive

nonprofits away from its social missions (Eikenberry & Kluver, 2004; Froelich, 1999; Gras & Mendoza-Abarca, 2014; Weisbrod, 2004). A variety of forces that influence the relationship between commercialization and nonprofit capacity make the effect sizes differ across studies, I, therefore, divide nonprofit capacity into two categories (i.e., financial and programmatic capacity) and examine the question of whether the influence of commercialization varies according to how original studies measure nonprofit capacity. This moderator is coded 1 for studies that use a financial measure of nonprofit capacity and 0 for studies that use programmatic measure of nonprofit capacity.

**Unrelated business income.** Nonprofits pay a tax to the Internal Revenue Service if they are engaged in commercial activities that are beyond the scope of their social missions. According to the IRS, a commercial activity is deemed as an unrelated business if it meets three requirements. First, it should be a trade or business. Second, it should be regularly carried on. Third, it should be not substantially related to furthering the exempt purpose of an organization.<sup>21</sup> Although the requirements are established, there are a

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<sup>21</sup> Please see <https://www.irs.gov/charities-non-profits/unrelated-business-income-defined>

number of modifications, exclusions, and exceptions to the general definition of unrelated business incomes. Therefore, when a commercial activity is subject to income tax is a question that is difficult to answer.

Despite that, nonprofit professionals and scholars are also concerned with the question of whether unrelated business revenues crowd out private donations and lead to mission drift. Herman and Rendina's (2001) study found that donors, overall, do not really care about the revenue structure of a nonprofit; that is, where nonprofits obtain their revenues streams is rarely the concern of donors. However, they also found that some donors dislike nonprofits that get involved in commercial activities that do not advance social missions. The other concern of unrelated business income in the field is that the pursuit of the revenues might lead to agency problems in which nonprofit managers only care about their own benefits rather than nonprofit stakeholders' benefits, especially when the revenues bring opportunities for the increase in compensations (Du Bois, et. Al., 2004). Mission drift occurs when the rent-seeking behavior is exercised.

Due to the unique characteristics of unrelated business income, I examine the question of whether original studies that use unrelated business income to measure commercialization report smaller (or negative) effect sizes than original studies that use other revenues to measure commercialization. This moderator is coded 1 for studies that use unrelated business income to measure commercialization and 0 otherwise.

**Program Service Income.** Traditionally, commercialization is defined as nonprofits' reliance on revenue from sales of goods and services (Maier, Meyer, & Steinbereithner, 2016; Salamon, 1993). Following this definition, many studies have used program service revenues as the measure of commercialization to test its relationships with donations, nonprofit health, and service offering (Brown, 2018; Child, 2010). However, merely using program service revenues to measure commercialization cannot comprehensively reflect nonprofits' commercial activities; it ignores several commercial revenues such as investment income, income from investment of tax-exempt bond proceeds, royalties, and rental income that have been mentioned in some studies (Drake & Rhyne, 2002; Kerlin & Pollak, 2011; Woller, 2002). Since program services revenues

have been widely used in the literature to measure commercialization, I create a moderator that distinguishes studies that specifically use program service revenues from studies that use other approaches to measure commercialization. By using this moderator, I examine whether the influence of commercialization varies according to the approaches that original studies measure commercialization. This moderator is coded 1 for studies that use program service revenues to measure commercialization and 0 otherwise.

**Country: The U.S. nonprofits.** Nonprofit commercialization might be more acceptable by the public in one country than another. Also, governments in some countries might be more supportive to nonprofits that get involved in commercial activities than governments in other countries (Kerlin, 2006). These factors also affect the influence of commercialization on nonprofit capacity. Since most of the commercialization studies focus on U.S. nonprofits, I create a moderator that distinguishes the studies that focus on U.S. nonprofits from the studies that center around nonprofits in other countries. The moderator is coded 1 for studies that focus on the U.S. nonprofits and 0 otherwise.

**Data structure: longitudinal data.** The data structure of original studies might be able to explain the variation in effect sizes (Ringquist, 2013). The original studies in this meta-analysis use either longitudinal or cross-sectional data. Longitudinal data provide means to track the relationship between commercialization and nonprofit capacity over time and use different variance components than that of cross-sectional data; therefore, studies that use longitudinal data are deemed superior than studies that use cross-sectional data (Ringquist, 2013). I, therefore, create a moderator to test whether the influence of commercialization varies according to data structure in original studies. The moderator is coded 1 for studies that use longitudinal data and 0 for studies that use cross-sectional data.

**Regression techniques: fixed effects.** Compared with traditional OLS regression model, fixed-effects models are able to account for unobserved influences that are not measured or measurable in a study, which in turn produces less biased estimates. Fixed effect models have been widely used in commercialization research (Khanna, Posnett, &

Sandler, 1995; Segal & Weisbrod, 1998). I create a moderator to examine whether the influence of commercialization varies according to regression models used in original studies. The moderator is coded 1 for studies that use fixed effect models and 0 for studies that use other models.

**Publication bias.** The “file drawer problem” is that non-significant results are less likely to be published by academic journals. So, studies published in academic journals are a biased sample of the research actually conducted in a field if file drawer problem occurs in the field. In other words, published studies might overestimate the relationships of interest. Although the “file drawer problem” is a common issue, unpublished studies do not necessarily produce nonsignificant results, in some cases, they produce more significant results than published studies. That is, published studies might underestimate the relationships of interest as well. I, therefore, create a moderator to test whether the effect sizes in published studies, on average, are different from those in the unpublished ones. The moderator is coded 1 for published studies and 0 for unpublished studies.



**Environment variables.** The research on nonprofit commercialization has mainly used accounting or revenue variables to predict its effect on nonprofit capacity. Part of this is because the field lacks data to measure environmental factors that might affect the relationships between commercialization and nonprofit capacity. Many economic, political and industrial factors such as GDP, policy changes, and market competition levels have been widely discussed and even started to test in the literature (Greenlee & Tuckman, 2007; Keating, Fischer, Gordon, & Greenlee, 2005; LeRoux & Wright, 2010; Prentice, 2016). These factors are very likely to influence a nonprofit's revenue strategies and capacity. I, therefore, create a moderator to test whether the effect sizes in studies that include environmental variables are different from those that do not include environment variables. The moderator is coded 1 for studies that include environmental variables in regression models and 0 for otherwise.

**Subsectors.** The effect of commercialization on nonprofit capacity might vary according to subsectors. Nonprofits in different subsectors have very different revenue

structures. For example, most health care and higher education nonprofits rely heavily on commercial revenues to fulfill social missions. In contrary, most religious and environmental nonprofits do not rely heavily on commercial revenues. I, therefore, create subsector moderators to examine whether the differences in effect sizes exist. I group the effect sizes into 12 subsectors based on the NTEE classification. However, only arts, culture, & humanities and human services subsectors produce sufficient effect sizes for the moderator analyses. I include these two moderators in the models to examine the variation in effect sizes.

### **Model Specifications**

Meta-analysts calculate a weighted average effect size and explain variation in effect sizes across original studies. In general, the variation in effect sizes is more telling than the average of effect sizes. For example, an investigation of the average effect size between revenue diversification and nonprofit financial health offers merely a global association. Nonprofit scholars may be more interested in whether original studies that

use traditional three revenue streams to measure the Herfindahl-Hirschman index (HHI) produce lower effect sizes than original studies that use more than three revenue streams to calculate HHI. Nonprofit professionals are more interested in whether nonprofits operating in human services subsector return smaller effect sizes than nonprofits in other subsectors. Explaining differences in effect sizes is the focus of meta-analysis in NPM (Ringquist, 2013). Meta-regression models are used for explaining the variation.

A variety of meta-regression models have been recommended or developed since the 1970s (Glass, 1977; Smith & Glass, 1977; Hedges, 1982; Hedges & Olkin, 1985; Thompson & Higgins, 2002; Hedges, 2007; Gleser & Olkin, 2009). A basic meta-regression model has effect sizes as dependent variable and moderators as independent variables. Moreover, there are two major issues that lead to the concern of usefulness of basic meta-regression models in NPM (Ringquist, 2013). First, an effect size heterogeneity issue makes fixed effects meta-regression models not preferable. Instead, random effects meta-regression models that are able to explain the heterogeneity in effect sizes are used. Second, the violation of the independence of observation due to common

data sets, common research teams, or multiple effect size per study biases the variance of meta-regression parameter estimates. Several reliable random effects meta-regression models that control for non-independence have been introduced to handle the issues. Of the models, clustered robust variance estimations (CRVE), generalized estimating equations (GEE), and hierarchical linear models (HLM) are commonly employed in meta-analysis.

There are advantages and disadvantages of using each meta-regression model (Ringquist, 2013). For example, CRVE models are fewer complex models than GEE models; therefore, convergence issues are less frequently to occur in CRVE models (Zorn, 2006). Also, small sample correction techniques are available for CRVE models rather than GEE models when only a limited number of original studies can be used for meta-analyses. In contrary, GEE models are preferred over CRVE in which few original studies dominate the results with a large number of effect sizes. However, in general, the standard errors of parameters produced by both models are very similar; there is no big difference in choosing GEE or CRVE models (Burton, Gurrin, & Sly, 1998; Zorn, 2006).

On the other hand, HLM models are not preferable in management and administration research. It is because the performance of HLM models to control for correlated effect sizes clustered within original studies has not been rigorously examined. Also, HLM models focus on estimating cluster-specific effects, and the models lack ability to control for cluster-specific heteroskedasticity (Ringquist, 2013). Ringquist (2013) suggested that management and policy scholars better use CRVE and GEE rather than HLM models. However, recent simulation research has shown that HLM models yield valid and unbiased results although more studies to investigate its performance is also suggested (Cheung, 2014; Van den Noortgate, López-López, Marín-Martínez, & Sánchez-Meca, 2013).

Besides the meta-regression approaches, there is another approach introduced by Cheung (2008) to conduct meta-analysis. It incorporates meta-analysis within a structural equation modeling framework. There are multiple advantages of conducting meta-analysis within the framework. This approach is especially advantageous over the traditional meta-regression approaches in that it equips with a better method, Full-

Information Maximum Likelihood Estimation (FIML), to handle missing data (Cheung, 2014).<sup>22</sup> A common study selection process in traditional meta-analysis is to exclude original studies that do not report sufficient information for coding. There are disadvantages of excluding the studies. For example, researchers might overestimate effect sizes of interest since many studies that do not report sufficient information are unpublished studies that may be more likely than published studies to produce nonsignificant results. Also, removing those studies prohibits knowledge advancement since some important study characteristics that might contribute to our understanding of theories are excluded (Cooper & Hedges, 2009). The missing data method, FIML, enables meta-analysts to retain the original studies they might have excluded because of the lack of information provided by original studies. Also, FIML is found to produce more accurate estimations than other missing data handling methods (e.g., listwise deletion, pairwise deletion, mean substitution, and multiple imputation) and under various missing assumptions (e.g., missing completely at random, missing at random, and

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<sup>22</sup> Other advantages of using SEM-based meta-analysis can be found in Schmidt and Hunter (2014).

not missing at random) (Cheung, 2014; Enders, 2010). The performance of SEM-based meta-analysis will be evaluated in the chapter 4.

No matter which meta-regression models are used in this meta-analysis, the model could be specified as follows. The dependent variable in the model is effect sizes and the independent variables are the 10 moderators mentioned above. I use the GEE model to examine the variation in effect sizes since it fits this study best (i.e., few original studies dominate the results with a large number of effect sizes and GEE models place less emphasis on the influential studies that produce many effects).

$$Y_i = b_0 + b_1X_{1i} + b_2X_{2i} + \dots + b_8X_{8i} + s_1X_{9i} + s_2X_{10i} + e_i \quad (6)$$

Where

$Y_i$  : Effect Size in Original Study  $i$

$X_1$ : whether an effect size is estimated from a model that uses a financial measure of nonprofit capacity, yes = 1 and no = 0

$X_2$ : whether an effect size is estimated from a model that uses unrelated business income to measure commercialization, yes = 1 and no = 0

$X_3$ : whether an effect size is estimated from a model that uses program service revenues to measure commercialization, yes = 1 and no = 0

$X_4$ : whether an effect size is estimated from a model that focuses on the U.S. nonprofits, yes = 1 and no = 0

$X_5$ : whether an effect size is estimated from a model that uses longitudinal data, yes = 1 and no = 0

$X_6$ : whether an effect size is estimated from a model that uses fixed effect techniques, yes = 1 and no = 0

$X_7$ : whether an effect size is estimated from a published study, yes = 1 and no = 0

$X_8$ : whether an effect size is estimated from a model that includes environmental variables, yes = 1 and no = 0

$X_9$ : whether an effect size is estimated from a model that tests only arts, culture, and humanities nonprofits, yes = 1 and no = 0



X<sub>10</sub>: whether an effect size is estimated from a model that tests only human services nonprofits, yes = 1 and no = 0

It should be noted that another concern in meta-analysis lies in the selection of an appropriate framework for conducting meta-analysis: fixed-effects or random-effects frameworks. Fixed-effects framework assumes “there is a single fixed effect size characterizing the relationship between focal predictor X and the dependent variable Y” and “individual effect sizes vary across studies solely because of sampling error” (Ringquist, 2013, p.118, p119). Under this framework, effect sizes calculated can only be applied to the studies included in meta-analysis data sets, which means the effect sizes cannot be generalized to other existing studies (i.e., external validity issue). In contrast, a random-effects framework assumes the population effect size “as a normally distributed random variable” and the effect sizes included in meta-analysis data sets represent “a random sample from the population of effect sizes of interest” (Ringquist, 2013, p.120, p121). Under this framework, any conclusion drawn has greater external validity.

Multiple tests and statistics have been developed to determine which framework should be used in a meta-analysis. For example, the Q test has been used to examine whether variation in effect sizes is solely explained by sampling error and evaluate if effect sizes are homogeneous. If effect sizes are homogeneous, a fixed-effect framework fits the data well and should be used to conduct meta-analysis. If effect sizes are heterogeneous, random-effects framework should be used. Also, the  $I^2$  statistic has been introduced to measure the magnitude of the effect size variance (Higgins & Thompson, 2002). Although the tools are available, the limitations and warnings of using the tools to determine which framework should be used have been discussed (Higgins, Thompson, Deeks, & Altman, 2003). Ringquist (2013) suggested that meta-analysis in the field of public management and policy should use random-effects framework since studies in the field generate significant effect size heterogeneity that are inconsistent with the assumption of fixed-effects framework. Therefore, I use random-effects framework for this study.

### **Results from Meta-Regression Analyses**

In this section, I present results for the two meta-analyses. One focuses on the relationship between commercialization and nonprofit capacity while the other focuses on the relationship between commercialization and nonprofit donations.

### **First Meta-Analysis: The Relationship between Commercialization and Nonprofit Capacity**

I use a random-effects framework to calculate the overall effect size. The mean effect size was  $-.003$  ( $z = -.36$ ,  $p > .05$ ). This result indicates the relationship is not statistically significant. Thus, there is no relationship between commercialization and nonprofit capacity.

I use random-effects meta-regression models to examine the variation in effect sizes as well. I consider 10 moderators and present 5 different model results due to the concern of multicollinearity stemming from high correlations between effects generated

from multiple moderators. Specifically, effects generated from the United State nonprofits are highly correlated with those effects drawn from longitudinal studies, correlated at .53. Also, effects generated from fixed-effect models are highly correlated with those effects drawn from arts, culture, and humanities nonprofits, correlated at .55. Therefore, I do not include the country moderator in the same model with the data structure moderator. Similarly, I do not include the model specification moderator in the same models with the arts, culture, and humanities nonprofits moderator. No other moderator intercorrelations approached .50 (Table 6).

Table 6.

*Correlations between the Model Variables Used to Explain the Variation in Effect Sizes  
of the Relationship between Commercial Revenues and Nonprofit Capacity*

No	Variables	1	2	3	4	5	6	7	8	9	10
1	<i>Nonprofit Capacity</i>	–									
2	<i>Unrelated Business Income</i>	-.12	–								
3	<i>Program Service Revenues</i>	.26	-.21	–							
4	<i>Country</i>	-.13	-.09	.26	–						
5	<i>Data Structure</i>	-.16	-.05	.00	.53	–					
6	<i>Model Specifications</i>	-.32	.06	-.08	.19	.42	–				
7	<i>Publication Bias</i>	.18	.01	-.23	-.26	-.19	-.42	–			
8	<i>Environmental Variables</i>	.12	-.01	-.07	-.02	-.14	-.15	.27	–		
9	<i>Arts, Culture, &amp; Humanities</i>	-.41	.12	-.10	.39	.32	.55	-.32	-.16	–	
10	<i>Human Services</i>	.22	.07	.07	-.34	-.33	-.21	.05	-.08	-.34	–

**Influence of nonprofit capacity measure on effect sizes.** I divide nonprofit capacity into financial and programmatic measures and examine whether the influence of commercialization varies according to this measurement difference. In the sample of 545 effect sizes, 383 effect sizes represent financial capacity and 162 represent programmatic capacity. Notably, the difference between the effect sizes of the two measures is not statistically significant in any of the GEE models (Table 7). Despite the strong arguments that commercialization is beneficial to nonprofit financial capacity and is harmful to nonprofit programmatic capacity, I find no moderation of commercialization effect size due to the dichotomy of nonprofit capacity measures.

**Influence of unrelated business income on effect sizes.** Indeed, some donors think nonprofits should stay away from commercial activities that are not related to social missions (Herman & Rendina, 2001). They are concerned with rent-seeking behaviors excised by nonprofit managers who do not care about nonprofits' program offerings (Du Bois, et. Al., 2004). Many of them even do not make contributions to those business-like nonprofits (Guo, 2006; Kingma, 1995). This suggests that unrelated business income

might have a negative impact on nonprofit capacity when compared with other commercial revenues. I test this hypothesis by distinguishing studies that use unrelated business income from studies that use other commercial revenues. In the sample of 545 effect sizes, 57 effect sizes represent unrelated business income and 488 represent otherwise. However, the moderator analysis indicates that effects calculated from models that use only unrelated business income to measure commercialization are not significantly different from effects calculated from models that use other commercial revenues.

**Influence of program service revenues on effect sizes.** Program service revenue has been widely used as a proxy of nonprofit commercialization in the literature. I therefore examine whether effect sizes from studies that use program service revenues as the proxy are different from effect sizes from studies that use other revenues. In the sample of 545 effect sizes, 148 effect sizes represent program service revenues and 397 represent otherwise. Effects from both calculations return similar estimates.

**Influence of U.S. data on effect sizes.** Similarly, our moderator for U.S. data is not statistically significant in any of the five models in Table 7. In the sample of 545 effect sizes, 437 effect sizes represent U.S. studies and 108 represent otherwise. The results of the models do not support the conclusion that the effects from U.S. studies are different from the effects from non-U.S. studies.

**Influence of panel data on effect sizes.** The moderator for panel data examines differences between studies that use panel data and studies that use cross-sectional data. In the sample of 545 effect sizes, 433 effect sizes represent panel data studies and 112 effect sizes represent cross-sectional studies. The results support the hypothesis that the influence of commercialization varies according to data structure in original studies. Studies that use panel data, on average, report larger effect sizes.

**Influence of fixed-effect models on effect sizes.** The moderator for fixed-effect models tests for differences between effects derived from fixed-effect models and those produced by other regression models. In the sample of 545 effect sizes, 241 effect sizes



represent panel data studies and 304 effect sizes represent cross-sectional studies.

However, the results do not support the hypothesis that the influence of commercialization varies according to whether fixed-effect models are used in original studies.

**Influence of publication bias on effect sizes.** The moderator for publication bias examines for whether the published studies report larger effect sizes. In other words, I am concerned with whether the scholarship over-estimates the relationship between commercialization and nonprofit capacity.<sup>23</sup> In the sample of 545 effect sizes, 347 effect sizes come from published studies and 198 effect sizes are from unpublished studies. Although the effects from published studies are different from unpublished studies in two of the five models, the two models (Model 3 and 4) show marginal significance,  $\beta = .07$ ,  $SE = .05$ ,  $p < .10$ , the full model (Model 5) returns no significance. Therefore, the scholarship, overall, does not produce biased estimates of the relationship.

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<sup>23</sup> In some cases, unpublished studies produce more significant results than published studies, so the scholarship might underestimate the relationship as well if only published studies are included in meta-analysis.

**Influence of environmental variables on effect sizes.** The literature has increasingly come to emphasize the influence of environmental variables on revenue strategies and organizational capacity of nonprofits. Multiple environmental variables have been found to be effective in explaining nonprofit financial capacity (Prentice, 2016). The moderator for environmental variables examines differences between effects derived from models that include environmental variables and effects that come from models that do not include environmental variables. In the sample of 545 effect sizes, 61 effect sizes come from models that include environmental variables and 484 effect sizes are from models that do not include environmental variables. The results support the hypothesis that the influence of commercialization varies according to whether the models include environmental variables. The models that include environmental variables, on average, return larger effect sizes (more positive).

**Influence of subsector on effect sizes.** The influence of commercialization might vary according to subsector types of nonprofit organizations. Commercialization might

be beneficial for one subsector, but harmful for another. The moderators for subsector examine the differences between studies that only concentrate on arts, culture and humanities (human Services) subsector and studies that focus on other subsectors. In the sample of 545 effect sizes, 207 (85) effect sizes come from studies that only focus on arts, culture and humanities (human services) subsector and 338 (460) effect sizes are from other subsectors. Although one model shows marginal significance for arts, culture and humanities subsector, the influence of commercialization, overall, does not vary according to subsector types of nonprofit organizations.

Table 7.

*GEE Random-Effects Meta-regression (42 Studies, 545 Effects)*

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Nonprofit Financial Capacity</i>	-.02 (.03)	-.02 (.03)	-.01 (.03)	-.01 (.03)	-.01 (.03)
<i>Unrelated Business Income</i>	.03 (.02)	.03 (.02)	.03 (.02)	.03 (.02)	.03 (.02)
<i>Program Service Revenues</i>	.05 (.05)	.05 (.04)	.04 (.04)	.03 (.04)	.05 (.04)
<i>Countries</i>	-.05 (.06)	-.06 (.06)			-.11 (.07)
<i>Data Structures</i>			.15** (.05)	.17** (.06)	.16*** (.05)
<i>Model Specifications</i>	.09 (.06)		.04 (.04)		.03 (.04)
<i>Publication Bias</i>	.07 (.06)	.06 (.05)	.07~ (.05)	.07~ (.05)	.07 (.05)
<i>Environmental Variables</i>	.19** (.07)	.19** (.07)	.20** (.07)	.20** (.07)	.21** (.07)
<i>Arts, Culture, &amp; Humanities</i>		.05 (.03)		.04 (.03)	.05 (.04)
<i>Human Services</i>	-.02 (.06)	-.01 (.05)	-.01 (.06)	-.01 (.06)	-.01 (.06)
<i>Constant</i>	-.06 (.07)	-.03 (.06)	-.20** (.07)	-.21** (.07)	-.14~ (.08)
<i>Wald <math>\chi^2</math></i>	14.17	15.32	30.36	29.78	48.16

Note: Standard errors in parentheses; ~  $p \leq .10$ , \*  $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .001$

Additionally, I further investigate the variation in effect sizes by converting 5 moderators into 3 dummy variables for nuanced comparisons of effect sizes across different capacities, commercial revenues, and organizational types. For example, in the previous analysis, I compare the effects derived from studies that measure nonprofit financial capacity with the effects produced by studies that estimate nonprofit programmatic capacity. This comparison tells us the difference between the two broad groups of capacity; however, it does not reveal the results of pair comparisons among more narrowly defined capacity categories. Therefore, I turn the moderator into a dummy variable that uses donations as a reference group, and compare the effects derived from studies that measure nonprofit donations with effects produced by studies that estimate nonprofit financial health, program delivery, and survivability.

The same can be said for commercial revenues and organizational types. In the commercial revenue group, I treat studies that use aggregated commercial revenues as a reference group and compare its effects with effects produced by studies that measure

investment revenues, membership dues, program service income, and unrelated business income. In the organizational type group, I treat studies that use aggregated nonprofit organizations as a reference group and compare its effects with effects produced by studies that estimate arts, culture and humanities, human services, health care, education, and international development nonprofits. The results from the meta-regression models with the 3 dummy variables and 5 moderators are presented in Table 8 and discussed as follows.

The results from the nuanced comparisons reveal two additional findings. First, the relationship between commercialization and nonprofit capacity are more negative from studies that use nonprofit survivability as the dependent variables when compared to studies that use nonprofit donations. Second, the effects are more negative from studies that use membership dues as the independent variable when compare with studies that use aggregated commercial revenue streams. Other than that, the results from these new models are consistent with the previous models with data structure and environmental variables being statistically significant moderators.

Table 8.

*GEE Random-Effects Models: Nuanced Comparison (42 Studies, 545 Effects)*

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
<b><i>Nonprofit Capacity (Reference: Donations)</i></b>					
<i>Financial Health</i>	-.15~ (.08)	-.15* (.08)	-.14 (.10)	-.14 (.10)	-.13 (.09)
<i>Program Delivery</i>	.03 (.03)	.03 (.03)	.02 (.02)	.02 (.02)	.03 (.03)
<i>Survivability</i>	-.17~ (.10)	-.19* (.10)	-.22* (.10)	-.23* (.10)	-.21* (.10)
<b><i>Commercialization (Reference: All Revenues)</i></b>					
<i>Investment Income</i>	-.02 (.05)	-.03 (.05)	-.03 (.05)	-.04 (.04)	-.02 (.04)
<i>Membership Dues</i>	-.16* (.08)	-.16~ (.09)	-.17~ (.09)	-.17~ (.10)	-.16~ (.09)
<i>Program Services Income</i>	-.01 (.04)	-.02 (.04)	-.03 (.04)	-.03 (.04)	-.02 (.04)
<i>Unrelated Business Income</i>	.02 (.03)	.02 (.03)	.02 (.03)	.02 (.03)	.02 (.03)
<b>Country</b>	-.08 (.06)	-.08 (.06)			-.15* (.07)
<b>Data Structures</b>			.19*** (.05)	.21*** (.05)	.20*** (.04)
<b>Model Specifications</b>	.09 (.07)		.03 (.04)		.02 (.04)
<b>Publication Bias</b>	.04 (.06)	.03 (.06)	.05 (.05)	.05 (.06)	.04 (.05)
<b>Environmental Variables</b>	.24** (.08)	.23*** (.07)	.25** (.08)	.25*** (.08)	.26*** (.08)
<b><i>Organizational Types (Reference: All Orgs)</i></b>					
<i>Arts, Culture, and Humanities</i>		.04 (.05)		.02 (.04)	.04 (.04)
<i>Human Services</i>	-.04 (.05)	-.03 (.04)	-.04 (.05)	-.03 (.04)	-.03 (.03)
<i>Health Care</i>	.04 (.03)	.06 (.04)	.04 (.03)	.05 (.04)	.05 (.04)
<i>Education</i>	-.01 (.02)	.01 (.04)	-.01 (.02)	.01 (.03)	.01 (.04)
<i>International Development</i>	-.03 (.03)	-.02 (.04)	-.04 (.04)	-.03 (.04)	-.03 (.04)
<i>Constant</i>	.02 (.08)	.06 (.06)	-.16* (.07)	-.17* (.08)	.06 (.08)
<i>Wald <math>\chi^2</math></i>	53.15***	53.04***	60.59***	72.77***	74.59***

Note: Standard errors in parentheses; ~  $p \leq .10$ , \*  $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .001$

## **Second Meta-Analysis: The Relationship between Commercialization and Nonprofit**

### **Donations**

Besides capacity, another debate in the literature centers around the relationship between commercialization and nonprofit donations. Scholars are concerned with the question of whether nonprofits' donations decrease as their commercial revenues increase. The empirical studies have produced mixed results as well (Guo, 2006; Kingma, 1995; Stone, Hager, & Griffin, 2001; Okten & Weisbrod, 2000; Posnett & Sandler, 1989; Wicker, Breuer, & Hennigs, 2012; Yetman & Yetman, 2003). Of the 42 studies in the data set, 25 studies measured the relationship between commercialization and donations. I, therefore, conduct a subgroup analysis looking at the overall relationship between commercialization and nonprofit donations and the variation in effect sizes. The analysis process and method of this subgroup analysis are similar to that of the previous ones. The only difference is that the dependent variable in this analysis is donations rather than nonprofit capacity. Because of that, I create a moderator for the meta-regression analysis



to examine whether the influence of commercialization varies according to different types of donors. With regard to sample size, there are 25 studies with 298 effect sizes that are qualified for this subgroup meta-analysis. A list of the 25 studies can be found in Appendix B. The coding information can be found in Appendix C. The results are discussed as follows.

Consistent with the previous meta-analyses, I use a random-effects framework to calculate the overall effect sizes and conduct meta-regressions analyses. The mean effect size was  $-.03$  ( $z = -2.36$ ,  $p < .05$ ), with a 95% confidence interval of  $[-.063, -.006]$ . This result indicates a statistically significant negative overall relationship between commercialization and nonprofit donations. In the meta-regression analyses, I consider the same moderators used for the previous meta-analyses except for a variable: donations. In addition, the correlation analysis shows that no moderator intercorrelations approach .40. I focus my discussion on the results from the GEE models for this analysis as well since there are influential studies that produce many effects to this meta-analysis. In Table 9, Basic Model is a traditional OLS model without considering non-independence

and other methodological issues. GEE Model 1 is a model with primary moderators. By primary, I mean the results from the primary moderators would theoretically contribute to our understanding of nonprofit commercialization. GEE Model 2 is a full model, so the discussion below based on the results of the model. GEE Model 3 is a robust test with the deletion of extreme values.

**Influence of nonprofit donation measure on effect sizes.** Nonprofits receive donations from various sources. Some donors make their giving decisions carefully by digging into the details of nonprofit activities while others make the decisions based on their intuition (Tinkelman, 1998). Donors who carefully explore nonprofit activities and then make giving decisions are more likely to be institutional donors. Institutional donors could be government agencies, foundations, private companies, or trustee members who are more likely to spend extra time and/or hire professionals to look for nonprofits to which they really want to donate. Their giving decisions might be different from that of others since they are more likely to investigate nonprofits before the decisions. I, therefore, divide donations into institutional donors and others and examine whether the

influence of commercialization varies according to this measurement difference. In the sample of 298 effect sizes, 18 effect sizes represent institutional donors and 280 represent aggregated donations that institutional and individual donors are put together. Notably, the difference is not statistically significant in any of the GEE models (Table 9). I find no moderation of commercialization effect size due to the dichotomy of nonprofit donation measures.

**Influence of commercial revenue measure on effect sizes.** Studies that use different commercial revenues as the independent variables to predict donations might produce different effects. For example, some individuals do not like to donate to nonprofits that get heavily involved in commercial activities that are not related to organization missions (Herman & Rendina, 2001). Following this logic, an increase in unrelated business income might lead to a decrease in nonprofits donations. Therefore, the effect sizes produced by studies that use unrelated business incomes might be smaller (or more negative) than the ones produced by studies that use other commercial revenue streams. On the other hand, unrelated business income might bring autonomy nonprofits,

which in turn increases nonprofit donations (Kerlin, 2006). Specifically, many donations and government funding are restricted for certain social purposes. Nonprofits that never or rarely consider commercial revenues might put themselves in a situation where no funding could be used for fundraising expenses, which in turn might reduce the amount of donations they can receive. In other words, commercial revenues, especially those from unrelated business income, are more likely to allow nonprofit to use their money freely. Nonprofit donations increase as more monies are invested into fundraising. Following this logic, an increase in unrelated business income might lead to an increase in nonprofit donations (Gras & Mendoza-Abarca, 2014; Gronbjerg, 1991). In addition to unrelated business income, we might find the variation in effect size due to the studies that use other commercial revenues, such as investment income, member dues, and program service income.

I therefore create a dummy variable that identifies these different commercial revenues. Effects produced by studies that use aggregated commercial revenues are assigned as the reference group used to compared with effects calculated from studies

that use investment income, membership dues, program services income, or unrelated business income as independent variables. In the sample of 298 effect sizes, 103 effect sizes represent aggregated commercial revenues, 20 represent investment income, 12 represent membership dues, 142 represent program service income, and 21 represent unrelated business income. The meta-regression analysis indicates that effects calculated from models that only use investment income, member dues, or program service income to measure commercialization are not significantly different from effects calculated from models that use aggregated commercial revenues. However, statistically significant results appear when the effects produced by studies that only use unrelated business income and the effects calculated from studies that use aggregated commercial revenues are compared. Despite marginal significance, the finding reveals that studies that use unrelated business income, on average, produce more positive effect sizes. In other words, nonprofits donations are more likely to increase as unrelated business income increase.

**Influence of U.S. data on effect sizes.** The moderator for U.S. data is statistically significant in the two GEE models in Table 9. In the sample of 298 effect sizes, 253 effect sizes represent U.S. studies and 45 represent otherwise. The results of the models support the hypothesis that the effects from U.S. studies are different from the effects from non-U.S. studies.

**Influence of panel data on effect sizes.** The moderator for panel data examines for differences between effects derived from studies that use panel data and studies that use cross-sectional data. In the sample of 298 effect sizes, 251 effect sizes represent panel data studies and 47 effect sizes represent cross-sectional studies. The results support the hypothesis that the influence of commercialization varies according to data structure in original studies. Studies that use panel data, on average, report more positive effect sizes.

**Influence of fixed-effect models on effect sizes.** The moderator for fixed-effect models tests for differences between effects derived from fixed-effect models and those produced by other regression models. In the sample of 298 effect sizes, 103 effect sizes

represent panel data studies and 195 effect sizes represent cross-sectional studies.

However, the results do not support the hypothesis that the influence of commercialization varies according to whether fixed-effect models are used in original studies.

**Influence of publication bias on effect sizes.** The moderator for publication bias examines whether the published studies report larger effect sizes. In other words, I am concerned with whether the scholarship over-estimates the relationship between commercialization and nonprofit donations.<sup>24</sup> In the sample of 298 effect sizes, 185 effect sizes come from published studies and 113 effect sizes are from unpublished studies. The results show that the effects from published studies are not different from unpublished studies in the models. Therefore, the scholarship, overall, does not produce biased estimates of the relationship.

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<sup>24</sup> In some cases, unpublished studies produce more significant results than published studies, so the scholarship might underestimate the relationship as well if only published studies are included in meta-analysis.

**Influence of environmental variables on effect sizes.** The moderator for environmental variables examines for differences between effects derived from models that include environmental variables and effects come from models that do not include environmental variables. In the sample of 298 effect sizes, 28 effect sizes come from models that include environmental variables and 270 effects are from models that do not include environmental variables. The results support the hypothesis that the influence of commercialization varies according to whether the models include environmental variables. The models that include environmental variables, on average, return more positive effect sizes.

**Influence of subsector on effect sizes.** The influence of commercialization might vary according to subsector types of nonprofit organizations. Commercialization might be beneficial for nonprofit donations in one subsector, but harmful for nonprofit donations in another subsector. I, therefore, create a dummy variable to represent different types of subsectors. I assign effects produced by studies that include all types of nonprofits as a reference group and compare the effects with ones derived from studies



that only include arts, culture and humanities, human services, health care, education, or international development subsector. In the sample of 298 effects, 77 effects come from studies that only focus on arts, culture and humanities subsector, 44 from human services, 42 from health care, 25 from education, and 19 from international development. The models show statistically significant results for arts, culture and humanities, health care, and education subsectors, which suggests that the influence of commercialization, overall, varies according to subsector types of nonprofit organizations.

Table 9.

*Results of Random-Effects Meta-regression (n = 25 Studies, 298 Effects)*

Variables	Basic Model	GEE Model 1	GEE Model 2	GEE Model 3
<b><i>Institutional Donations</i></b>	.10* (.05)	.10 (.03)	.05 (.05)	.04 (.05)
<b><i>Commercialization (Reference: All Revenues)</i></b>				
<i>Investment Income</i>	.15** (.05)	.15 (.10)	.12 (.09)	.13 (.09)
<i>Membership Dues</i>	-.10 (.07)	.01 (.08)	-.06 (.10)	-.05 (.10)
<i>Program Services Income</i>	.18*** (.03)	.13 (.10)	.12 (.09)	.12 (.09)
<i>Unrelated Business Income</i>	.01 (.05)	.14** (.05)	.09~ (.05)	.09~ (.05)
<b><i>Country</i></b>	-.32*** (.05)		-.21** (.11)	-.20* (.10)
<b><i>Data Structures</i></b>	.14*** (.04)		.22*** (.04)	.18*** (.03)
<b><i>Model Specifications</i></b>	.05~ (.03)		.04 (.04)	.04 (.04)
<b><i>Publication Bias</i></b>	.06~ (.03)		.12 (.08)	.12 (.08)
<b><i>Environmental Variables</i></b>	.40*** (.04)		.30** (.11)	.28** (.11)
<b><i>Organizational Types (Reference: All Orgs)</i></b>				
<i>Arts, Culture, and Humanities</i>	.17*** (.03)	.08* (.04)	.10** (.04)	.09** (.04)
<i>Human Services</i>	.01 (.04)	-.01 (.04)	-.01 (.04)	.01 (.04)
<i>Health Care</i>	.07* (.04)	.10* (.04)	.10* (.04)	.10* (.04)
<i>Education</i>	-.01 (.05)	.07** (.04)	.07** (.03)	.07** (.03)
<i>International Development</i>	.11* (.05)	.01 (.02)	.01 (.03)	.01 (.03)
<i>Constant</i>	-.13** (.05)	-.04 (.08)	-.23* (.12)	-.21~ (.11)
<i>R-squared</i>	.44			
<i>F</i>	15.43***			
<i>Wald <math>\chi^2</math></i>		66.87***	439.37** *	451.23** *

Note: Standard errors in parentheses; ~  $p \leq .10$ , \*  $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .001$

## Summaries and Discussions

Meta-analysis offers a set of statistical techniques to synthesize inconsistent and contradictory results derived from original studies that focus on the same topics or research questions. It makes inconclusive results more manageable, which in turn holds promise for knowledge aggregation and has potential to contribute to knowledge advancement. This chapter uses the effect of commercialization on nonprofit organizations as an example to illustrate the roles meta-analysis plays in knowledge aggregation and advancement. In addition, this study provides clear-cut results in response to Young and Salamon's (2002, p.423) observation that "a significant commercialization or marketization of the nonprofit sector appears to be underway, although with consequences that are far from clear."

The first meta-analysis in this study focuses on the effect of commercialization on nonprofit capacity. The mean effect size was  $-0.003$  ( $z = -0.36$ ,  $p > .05$ ). The relationship is not statistically significant. This suggests there is no relationship between commercialization and nonprofit capacity. Although an average effect size has been

obtained from the meta-analysis, the result tells us little about the relationship since nonprofit capacity is a complicated concept that is hard to be summarized in a number. The attention is then shifted to the results from the meta-regression analyses where the relationship under different conditions can be assessed (Ringquist, 2013). The meta-regression results suggest that studies that use panel data or/and include environmental variables return more positive effect sizes than studies that use cross-sectional data or/and do not include environmental variables. The results have implications for future scholarship. That is, the effects vary according to what types of data structure used and whether environmental variables are included. However, the results contribute little to our understanding of the theoretical debates. For example, the effects produced from studies that measure nonprofit financial capacity are not statistically significant from the effects derived from studies that measure nonprofit programmatic capacity. The argument that commercialization might be beneficial to nonprofit financial capacity when compared to nonprofit programmatic capacity is not supported in this analysis. So does the arguments that unrelated business income might be detrimental to nonprofit capacity.

However, more significant differences are found when more nuanced treatments on nonprofit capacity and commercial revenues are conducted. For example, the effects are smaller from studies that use nonprofit survivability as the dependent variables when compared to studies that use nonprofit donations. This finding reveals the fact that nonprofit donations are more sensitive to commercial revenues when compared with nonprofit survivability. In other words, commercialization has more direct effect on nonprofit donations than nonprofit survivability. Second, the results also suggest that the effects are smaller from studies that use membership dues as the independent variables when compared with studies that use aggregated commercial revenue streams. The smaller effects might be due to membership dues being only a relatively small portion of nonprofit revenues. Therefore, any change in membership revenues has a relatively little effect on nonprofit capacity. Another possible explanation is that members who pay dues are less likely to donate to nonprofits. In other words, membership dues crowd out nonprofit donations, which in turn makes the effect sizes smaller. In addition to these two findings, data structure and environmental variables are also significant in explaining the variation in effect sizes in this meta-analysis.

In the second meta-analysis, the focus is on the effect of commercialization on nonprofit donations. The mean effect size was  $-.03$  ( $z = -2.36$ ,  $p < .05$ ), with a 95% confidence interval of  $[-.063, -.006]$ . The result indicates a statistically significant negative overall relationship between commercialization and nonprofit donations. Similar to the previous meta-analysis, data structure and environmental variables are significant moderators in explaining the variation in effect sizes in this meta-analysis. In addition, the results suggest that studies using unrelated business income, on average, produce more positive effects. This finding does not support the argument that unrelated business income is more likely to crowd out nonprofit donations (Herman & Rendina, 2001). A possible explanation is that unrelated business income brings flexibility into nonprofits. The flexibility enables nonprofits to spend money on fundraising more freely. Nonprofit donations increase as fundraising expenses increase.

Moreover, the results support the assumption that the effects from U.S. studies are different from the effects from non-U.S. studies. Commercial revenues are more likely to crowd out the U.S. nonprofit donations when compared to nonprofits in other countries. There are three possible explanations for this difference. First, this might be due to

nonprofit commercialization being less acceptable to American donors when compared to donors from other countries. In other words, American donors' aversion to nonprofit commercialization might be stronger than that of donors in other countries. Second, it is possible that American donors' obligation to nonprofits is more likely to be satisfied by their use of fee-charging services provided by nonprofits than that of donors in other countries. That is, American donors are more likely than donors in other countries to consider purchasing is a substitute for giving. Third, it is also possible that American nonprofit's expenditures in fundraising is more likely to reduce after commercial revenues become their stable funding sources. In other words, American nonprofits are more welcome commercial revenues than donations when compared with nonprofits in other countries. It, however, should be noted that it is a rough analysis to group all countries into two categories: United States and otherwise. The main reason why I classify countries this way is because research on nonprofit commercialization in other countries is still in its early stages, and not many studies focused on non-U.S. nonprofits can be included in the meta-analyses. Thus, future studies could select a particular non-U.S. country and conduct a detailed comparison analysis to understand why commercial revenues are more likely to crowd out nonprofit donations in the U.S.

Finally, the influence of commercialization varies according to subsector types of nonprofit organizations, with studies that focus on arts, culture and humanities, health care, or education subsector produce more positive effect sizes. The results not only reveal the fact that the financial structure and strategies of commercial nonprofits are different from that of donative nonprofits, but also demonstrate the fact that donors' reactions to these two types of nonprofits are differently.

Some implications for theory and practice are worth mentioning here. The weighted mean effect size indicates a negative relationship between commercialization and nonprofit donations. Moreover, the effect varies according to commercial revenues, countries, and organizational types. These findings provide foundation for future theory development on the crowding-out effect. Which theories are better than others at explaining the crowding-out effect could be better understood by further decomposing the effect under different contexts: commercial revenues, countries, and organizational types. If the crowding-out is primarily due to nonprofits' concern of watchdog organizations' evaluation based on their fundraising expenses and donor's aversion towards nonprofit commercialization, then institutional theory is better at explaining the crowding-out



effect. If the crowding-out is primarily due to nonprofits' reduced efforts in fundraising for bring autonomy and flexibility into organizations through commercialization and cultivating equal revenues from several sources to protect against uncertainty, then resource dependency theory is better at explaining the crowding-out effect. If the crowding-out is due to the mix of the above-mentioned reasons, then using multiple theories or building a new theory to explain the crowding-out effect is necessary. Thus, the decomposition of the crowding-out effect could be further explored in the future study to facilitate our understanding of nonprofit commercialization. In addition, future studies might find a crowding-in effect of commercial revenues in some cases. Decomposing the crowding-in effect could facilitate our understanding of nonprofit commercialization as well,

The first practice implication is related to the overall relationship between commercial revenues and nonprofit donations. The results suggest that there is no complete trade-off between commercial revenues and nonprofit donations. The results do not show that 1 dollar increase in commercial revenues leads to 1 dollar or more than 1 dollar decrease in nonprofit donations. Instead, the results indicate the increase leads to .03 dollar decrease in donations. Because the negative effect of commercialization on

nonprofit donations is not that pronounced, nonprofits that aim to get involved in or maintain commercial activities for increasing organizational revenues do not need to fear the crowding-out of donations. Second, some donors do not give to nonprofits that get involved in mission-unrelated commercial activities (Herman & Rendina, 2001); however, at the same time, it is undeniable that revenues from these mission-unrelated activities often come to nonprofits without strings attached so nonprofits are able to flexibly use the revenues for fundraising, which in turn increases donations. The latter effect could be stronger than the former effect, in most cases. Thus, if a nonprofit's goal is to increase total revenue, then there is no need to worry about the crowding-out effect brought to the nonprofit by mission-unrelated commercial activities too much. Third, nonprofits and donors behave differently in different contexts. Context matters. Donors' acceptance of nonprofit commercialization might be higher in one country but lower in another. So does nonprofits' commercialization. Thus, nonprofit professionals are better aware of donors' preferences, philanthropic cultures, and legal frameworks in the country where their nonprofits are located. Finally, organizational types matter. The crowding-out effect might be stronger in some subsectors. Thus, the negative effect of commercialization on nonprofit donations might be pronounced in those subsectors. In

the subsectors where the crowding-out effect is strong, nonprofit professionals need to reconsider the advantages and disadvantages of commercialization and rethink strategies to increase total revenues. On the other hand, it is also likely that commercial revenues crowd in donations in some subsectors. Implications for practice drawn from the crowding-in effect would be very different from that derived from the crowding-out effect. Future studies could devote more attention to it.

The main purpose of this chapter is to demonstrate how meta-analysis facilitates knowledge aggregation and contributes to knowledge advancement. The study of nonprofit commercialization in this chapter reveals that meta-analysis is able to facilitate knowledge aggregation by offering a clear-cut estimation of the relationship between variables of interests. This study also demonstrates that meta-analysis contributes to knowledge advancement. For example, the statistically significant findings regarding the effect of commercialization varies according to different types of nonprofit capacities, commercial revenue streams, and nonprofit organizations improving our understanding of the impact of commercialization on nonprofits. These differences are less likely to be found without conducting meta-analysis. In addition, the findings that the effects

produced by studies using panel data and/or including environmental variables are different from the effects derived from studies using cross-sectional data and/or not including environmental variables inform researchers that these two factors should be considered when conducting research on the impact of commercialization on nonprofit organizations. In the field of nonprofit finance, there are still some research questions needed to be answered by using meta-analysis. For example, studies on the effect of overhead ratios and nonprofit donations have produced mixed results that puzzle researchers and nonprofit professionals as well. A meta-analysis that synthesizes the relationship could facilitate our knowledge concerning overhead myth in the nonprofit sector.

Four weaknesses compromise the meta-analyses. It is common to see that original studies do not report sufficient information for the calculation of exact effect sizes. In this case, I estimate effect sizes in multiple ways (e.g., corresponding t-statistics). These estimated effect sizes, however, are low-bound estimates that represent conservative relationship between commercialization and nonprofit capacity (and donations). In other words, the actual effect sizes could be slightly higher than I estimate.

Second, moderator analysis is used to explain the variation in effect sizes in this meta-analysis. However, the dichotomous coding scheme for moderators used to explain the variation not only lose information about study characteristics, but also increase the likelihood of a multicollinearity issue in meta-regression models. Multiple important moderators are removed for the sake of minimizing the multicollinearity issue. The removal frequently lowers meta-regression models' ability to explain the variation in effect sizes. The consequence is that only a certain portion of the variation can be explained in meta-regression models.

Third, meta-analysis has long been criticized as a method that researchers use to compare apples with oranges. Although I narrow my definition of nonprofit capacity to programmatic and financial capacity, some might still argue that these two capacities are big concepts and are measured in a variety of ways; therefore, they cannot be directly compared. First, the measures may be of little concern since the measures are converted into  $r$  effect sizes that represent standardized correlation coefficients between commercialization and nonprofit capacity. Using  $r$  effect size makes the comparison among original studies meaningful. Second, defining nonprofit capacity as programmatic

and financial capacity and synthesizing studies that measure the two capacities into an effect size might be meaningless. However, using meta-regression analyses to examine whether the difference between effects derived from studies that measure financial capacity and from studies that measure programmatic is conceptually meaningful based on the arguments in the literature that commercialization may be beneficial to nonprofit finance but detrimental to nonprofit program services. In short, the criticism of comparing apples with oranges should not be a concern in this study.

Finally, it is too early to conduct a meta-analysis examining the effect of commercialization on nonprofit capacity. Nonprofit capacity is a multidimensional concept and can be measured in a variety of ways. Of the 42 original studies I select for the meta-analysis, 25 original studies focus their estimates of the effects of commercialization on nonprofit donations. In other words, there are only 17 original studies that use non-donation indicators to measure nonprofit capacity. More studies that use non-donation indicators to measure nonprofit capacity are needed. Thus, it is more appropriate to perform the meta-analysis of the effect of commercialization on nonprofit capacity when more studies on nonprofit capacity are conducted.

In the next chapter, I shift my discussion to SEM-based meta-analysis. This is a newly-developed approach for conducting meta-analysis. This approach integrates meta-analysis and three-level HLM into SEM. The next chapter aims at examining whether the use of SEM-based meta-analysis can produce equivalent results. If the results are equivalent to that of traditional meta-regress models, it suggests that the concerns of using three-level HLM to conduct meta-analysis raised by Ringquist (2013) may be overstated. In addition, the next chapter examines the effectiveness of using FIML under SEM to handle missing data in meta-analysis. If the use of FIML on missing data is able to produce equivalent results, field members should set higher priority for conducting meta-analysis under SEM framework in Mplus since missing data are ubiquitous in meta-analysis (Cooper & Hedges, 2009).

## CHAPTER 4

### INTEGRATING META-ANALYSIS INTO STRUCTURAL EQUATION MODELING

*The great advances in science usually result from new tools rather than from new doctrines.*

— Dyson (1996, p. 805)

Advanced meta-regression models, such as GEE and CRVE, are used in the field of public management and policy due primarily to their superiority in handling non-independence, heteroskedasticity, and dominant studies issues. First, non-independence means that effect sizes are correlated within original studies. The effect sizes are correlated because original studies often use common data sets or are conducted by common research teams. The clustered correlations, however, violate the independence of observation assumption that underlies OLS regression analysis. Second, study-level heteroskedasticity in the error term is a common issue when multiple effect sizes from each original study are included in meta-analysis. Finally, it is common to see that a small number of studies that produce a large number of effect sizes included in a meta-analysis. These dominant studies may make the results unrepresentative. Therefore, models, such as GEE and CRVE, are



equiped with techniques to handle these three challenges (Ringquist, 2013). These challenges are unable to be solved when traditional OLS meta-regression models are employed.

Besides GEE and CRVE models, hierarchical linear models (HLM) are used for meta-analysis in social sciences as well. HLMs fit well with data that have a hierarchical structure. For example, when studying the effect of a social policy reform, researchers might have performance data for nonprofits nested within communities. In this case, nonprofits are at the lowest level of the hierarchy and communities are at a higher level. The same can be said for meta-analysis data where effects are nested within studies. However, there are concerns of using HLM in meta-analyses. First, it is believed that the HLM method requires more assumptions than GEE and CRVE models, which makes a less robust method of controlling for non-independence (Ringquist, 2013). Second, it has been said that the HLM method has no remedies for meta-analyses that synthesize a small number of original studies, and the method frequently experiences convergence problems when analyzing large numbers of observations (Ringquist, 2013; Steenbergen & Jones, 2002). Third, it is believed that HLM techniques have relatively more difficulty addressing effect sizes of independent variables that do not vary within original studies (Ringquist, 2013). Because of these reasons,

Ringquist (2013) suggests that the HLM method has no advantages over GEE and CRVE models for meta-regression and should not be a potential method for meta-analyses.

Recent simulation research, however, has shown that the HLM method yields valid and unbiased results. The research has also suggested that more studies to investigate its performance are required (Cheung, 2014; Van den Noortgate, López-López, Marín-Martínez, & Sánchez-Meca, 2013). Moreover, another recent development in the literature is to integrate HLM meta-analyses into structural equation modeling (Cheung, 2008; Cheung, 2014). This approach is called SEM-based meta-analysis, which links three unrelated statistical methods (i.e., three-level HLM, meta-analysis and SEM) together, by Cheung (2008). Similar to traditional meta-analyses, *SEM-based meta-analyses* are able to quantify the heterogeneity of effect sizes and account for the variation in effect sizes. Apart from that, SEM-based meta-analyses are able to handle missing data using the full information maximum likelihood, place less constraints on parameters, and construct better confidence intervals (Cheung, 2014). These recent developments call for analyses of the use of SEM to conduct meta-analysis and comparisons of results from SEM-based meta-analyses and other approaches (e.g., GEE and CRVE).

In this chapter, I conduct a three-level HLM meta-analysis under the SEM framework. This effort contributes to the literature in at least two ways. First, it compares the results from the SEM-based meta-analyses and the GEE approach meta-analysis to examine whether they are equivalent. If they are equivalent, I indirectly demonstrate that the results from SEM-based meta-analyses are likely to be valid and unbiased. That is, Ringquist's (2013) concerns of the use of three-level HLM method to conduct meta-analysis in the field of nonprofit and public management might be overstated. Second, I introduce this newly developed method into the field and, if valid and unbiased results are demonstrated, I urge field members to consider conducting meta-analysis under the SEM approach, especially when missing data are present. I use the impact of commercialization on nonprofit donations as an example; therefore, the data set used in this chapter is the same as the one used in the previous chapter. In other words, this SEM-based meta-analysis includes 25 studies with 298 effect sizes.

This chapter is organized as follows. The next section contains a brief introduction to SEM-based meta-analysis. Second, the data and software used to conduct the analysis is introduced. Third, the results from SEM-based meta-analysis are discussed and compared to

the results from the GEE approach. Finally, I draw conclusions from the results and offer suggestions.

### **SEM-Based Meta-Analyses**

Several meta-regression models have been developed to conduct meta-analyses. In the previous chapter, I use GEE and CRVE models to conduct meta-analysis and briefly mention that HLM methods are not recommended in the field of public policy and management since it is believed that the method's ability to handle non-independence effect sizes has not been rigorously examined, the method's inability to control for cluster-specific heteroskedasticity, and so on (Ringquist, 2013). However, recent methodological developments have provided advancements in these respects (Cheung, 2014). In the following discussion, I start with the introduction of the two-level HLM method. Then, I shift my discussion to a three-level HLM method and talk about the advantages of using the three-level model to conduct meta-analysis. Finally, I briefly present how to integrate three-level HLM meta-analysis into SEM and conclude with the discussion of how the application of the three-level HLM SEM-based meta-analysis will contribute to the field.

A traditional way of using HLM to conduct meta-analysis employs a two-level model.

An example of a two-level model is the aforementioned case where scholars consider communities when examining nonprofit performance since nonprofits are nested within communities. In this case, nonprofit organizations are at the first level and communities are at the second level. The same can be said when we use two-level HLM to conduct meta-analysis where level 1 refers to the effects and level 2 refers to the original studies (Cheung, 2014).

The model can be specified as follows. The two-level model has been used to conduct meta-analysis. However, the application is not without limitations. One of the biggest limitations of the two-level model is that it is unable to handle the issue of non-independence. Because of that, three-level HLM was developed and deemed more appropriate for meta-analyses that synthesize studies that each produces multiple effect sizes.

$$y_i = \lambda_i + e_i \quad \text{Level 1} \quad (7)$$

$$\lambda_i = \beta_0 + u_i \quad \text{Level 2} \quad (8)$$

Where

$y_i$  is a generic effect size in the  $i$ th study

$\lambda_i$  is the “true” effect size in the  $i$ th study

$\beta_0$  is the average population effect

Basically, the three-level HLM method is extended from the two-level HLM method by adding a cluster effect. The effort of adding one more level for modelling the dependent effect sizes in meta-analysis is deemed as a necessary step to reduce biased estimation (Cheung, 2014). This method of handling dependent effect sizes is better than other traditional approaches used in the HLM method, such as (1) ignoring the dependence and treating the data as if they are independent, (2) averaging the dependent effect sizes into a single effect size for each original study and using the weighted mean effect sizes for the analyses, and (3) selecting only one effect size and ignoring all others to handle dependence.<sup>25</sup> In addition, although the third level cluster often refers to effect sizes nested

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<sup>25</sup> For more detailed discussion, please refers to (Cheung, 2014).

with in original studies, the definition of the cluster depends on research questions and data structure (Cheung, 2014). The cluster could be one of the studies in a country group as well.

The model can be specified as follows.

$$y_{ij} = \lambda_{ij} + e_{ij} \quad \text{Level 1} \quad (9)$$

$$\lambda_{ij} = \kappa_j + u_{(2)ij} \quad \text{Level 2} \quad (10)$$

$$\kappa_j = \beta_0 + u_{(3)j} \quad \text{Level 3} \quad (11)$$

Where

$y_i$  is a generic effect size in the  $i$ th study

$\lambda_i$  is the “true” effect size in the  $i$ th study

$\kappa_j$  is the average effect in the  $j$ th cluster

$\beta_0$  is the average population effect

The three-level HLM meta-analysis has never been integrated into SEM until Cheung (2014). Before his introduction, meta-analysis and SEM are treated as two important but unrelated topics in the literature. As Cheung (2008, p.183) states “meta-analysis and SEM have their own traditions and terminologies.” Moreover, Stapleton and Leite’s (2005) analysis of more than 50 SEM syllabi find that none of them cover meta-analysis as a topic.

However, since SEM's ability to test complicated models in a flexible framework, its popularity has rapidly increased among social scientists. The integration of models into SEM has appeared in item response theory models, multilevel models, mixture modeling, survival analysis, latent class models, and so on. It is until Cheung (2008) that meta-analysis was integrated into SEM and the advantages of using SEM-based meta-analysis was introduced. In addition, in a subsequent paper, Cheung (2014) further demonstrates how to conduct three-level HLM meta-analysis under the SEM approach in Mplus.

The concepts of phantom variables, definition variables, and FIML are important when formulating meta-analytic models as SEM (Cheung, 2015). First, phantom variables are "latent variables with no observed indicators" (Rindskopf, 1984, p.38). The variables are used to ensure that estimated coefficients are nonnegative. Second, definition variables are used to fix subject-specific values to any parameters in a model, such as path coefficients, factor loadings, means, and error variables. The variables are used to fix the known sampling variances as variance of measurement error in meta-analytic SEM models. Third, FIML is used in SEM and SEM-based meta-analysis to handle incomplete data. This missing data approach performs better than conventional methods, such as listwise deletion, pairwise deletion, and mean substitution, in handling missing data when the missingness is missing



completely at random, missing at random, or not missing at random (Cheung, 2007; Cheung, 2008; Enders, 2001).

When conducting meta-analyses, researchers have to decide whether fixed-effects or random-effects framework fits their research better. A fixed-effect framework assumes that effect sizes are homogeneous within studies and conclusions can only be drawn for studies included in meta-analyses, whereas a random-effects framework assumes that effect sizes are heterogeneous and conclusions can be generalized beyond studies included in meta-analyses. Basically, the terms used for traditional meta-analysis and meta-regressions are similar to the terms used in SEM-based meta-analysis. However, there is a unique term created to refer to meta-regressions in SEM-based meta-analysis: mixed-effects model. When using a SEM approach to model the three-level HLM meta-analysis in the field of nonprofit and public management, the mixed-effects model designed to account for variation in effect sizes should be employed (Cheung, 2015; Ringquist, 2013). By using mixed-effects models, we assume that there is a high degree of heterogeneity at level 2 or level 3 of HLM. The three-level HLM meta-analysis with Two Studies and One Moderator in the  $j$ th cluster under SEM framework is specified as follows.

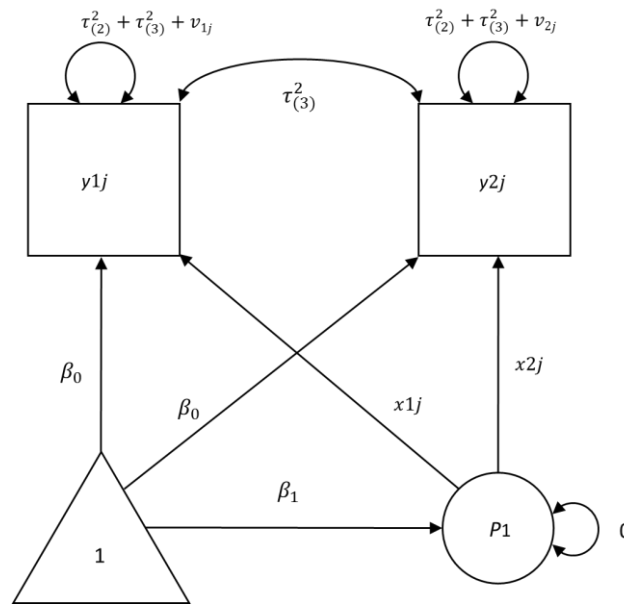


Figure 5. A Three-Level HLM SEM-Based Meta-Analysis Model

To understand the model in Figure 5, I use the meta-analysis of the relationship between commercial revenues and nonprofit donations as an example to illustrate the SEM method. Assuming the I collect 2 studies with 10 effect sizes and use 1 moderator to conduct the meta-analysis, 10 effect sizes of these two studies are represented by two variables  $y_1$  and  $y_2$  in the model and  $x_{ij}$  represents the moderator.  $\beta_0$  represents an expected mean for the two studies,  $\beta_1$  is a regression coefficient (i.e., the coefficient is the relationship between commercial revenues and nonprofit donations if we hold everything constant), and  $P1$

represents a phantom variable. Once the collected studies and moderators are increased, the model becomes more complicated.

In the following sections, I conduct a three-level HLM meta-analysis under the SEM approach in Mplus to answer two questions. First, I examine whether Ringquist's (2013) concerns of the use of HLM to conduct meta-analyses in the field of public policy and management are overstated. In his seminal book of meta-analysis, Ringquist (2013) argues that HLM models are not preferable in that its performance to control for correlated effect sizes clustered within original studies has not been rigorously examined, its focus on estimating cluster-specific effects, and the lack of ability to control for cluster-specific heteroskedasticity. However, recent methodological developments have demonstrated that three-level HLM meta-analysis are able to yield valid and unbiased results, although more studies to examine its performance are required (Cheung, 2014; Van den Noortgate, López-López, Marín-Martínez, & Sánchez-Meca, 2013). I, therefore, test its performance by examining whether the results between the conventional meta-analysis (e.g., GEE) and three-level HLM meta-analysis are equivalent. If the results are equivalent, it builds evidence that three-level HLM can be used for meta-analysis to produce valid and unbiased results,

especially within SEM framework, and field members are equipped with one more technique to conduct meta-analysis.

Second, I test how better FIML is able to handle missing data when conducting meta-analyses within a SEM framework. Cooper and Hedges (2009) argue that “the prevalence of missing data on a moderator.....influences the degree to which the problems investigated by the synthesis can be formulated” (p. 565). They regard missing data as the most pervasive problem in meta-analysis. Several methods of dealing with missing data have been proposed and FIML is believed to perform relatively better than other methods (Cheung, 2007; Cheung, 2008; Enders, 2001). However, the comparison of the meta-analysis results between GEE models and three-level HLM under the SEM approach with FIML method has never been conducted. If SEM-based three-level HLM meta-analysis with FIML is able to produce valid and unbiased results, field members who conduct meta-analysis with a serious data missing issue are urged to use SEM-based meta-analysis in Mplus for better results.

## Methods

The data set used for the three-level HLM SEM-based meta-analysis in this chapter is the same as the one used for the traditional approach meta-analysis in the previous chapter (i.e., GEE models). Specifically, I use the impact of commercialization on nonprofit donations as an example to examine the two above-mentioned research questions: (1) whether the results of meta-analysis between the GEE model and three-level HLM SEM-based model are equivalent, and (2) whether the three-level HLM SEM-based meta-analysis with FIML to handle missing data is able to produce valid and unbiased result. There are 25 original articles with 298 effect sizes and 10 moderators in the data set.

In order to answer the two questions, I run two three-level HLM SEM-based models and compare the meta-regression results of the moderators from the three-level HLM SEM-based models to the results of the moderators from the GEE models. If the results from the two three-level HLM SEM-based models are equivalent to that from the GEE models, the concern over the performance of the three-level HLM SEM-based model can be mitigated and the claim about the effectiveness of the application of FIML to the three-level HLM

SEM-based model can be supported. To simplify the discussion in the following sections, I focus my attention on three randomly selected moderators. These three moderators are: (1) unrelated business income, (2) country, and (3) education subsector. Based on the results from the GEE models run in the previous chapter, I found that *unrelated business income* returns more positive effects,  $\beta = .09$ ,  $p < .10$ ; the *United States nonprofits* returns more negative effects,  $\beta = -.21$ ,  $p < .01$ ; and *education subsector* returns more positive effects,  $\beta = .07$ ,  $p < .01$  (Table 10). The coefficients and standard errors produced by the three-level HLM SEM-based meta-analyses in this chapter are expected to be consistent with that produced by the GEE models run in the previous chapter.

Table 10.

*Results of the Three Selected Moderators (25 Studies, 298 Effects)*

Variables	GEE Model
<b><i>Commercialization (Reference: All Revenues)</i></b>	
<i>Unrelated Business Income</i>	.09~ (.05)
<b><i>Country</i></b>	-.21** (.10)
<b><i>Organizational Types (Reference: All Orgs)</i></b>	
<i>Education</i>	.07** (.03)
<i>Constant</i>	-.21~ (.11)
<i>Wald <math>\chi^2</math></i>	439.37***

Note: Standard errors in parentheses; ~  $p \leq .10$ , \*  $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .00$

To answer the first research question, I specify a three-level HLM SEM-based model in Mplus for conducting the meta-analysis. Some model specifications in Mplus are worth highlighting. First, the main difference between a two-level model and three-level models is that a cluster effect is added to the three-level model. Since effect sizes are clustered within original studies, effect size identification number in the syntax is specified at level-2 while original study identification number is specified at level-3. Second, study characteristics variables (i.e., moderators) is specified at level-2 as well; the variables are used to explain the variation in effect sizes. Finally, instead of using maximum likelihood (ML) estimator, I use

maximum likelihood with robust standard errors (MLR) estimator, which produces robust standard errors (sandwich or Huber-White standard errors). This MLR specification is against non-normality and model misspecification (Cheung, 2014) and consistent with the specification designed for GEE models. Thus, the results from both GEE models and three-level HLM SEM-based models can be compared. The syntax used for the three-level HLM SEM-based model is as follows (Table 11).



Table 11.

*Mplus Syntax for a Three-Level HLM SEM-Based Model*

```

Title: Mixed-Effects Model_Commercialization

Data: File is Com.dat;

Variable: names cluster id y v indonor dr1 dr2 dr3 dr4 country dstruc mspec pbias evar dt1 dt2 dt3 dt4 dt5;

Usevariables y indonor dr1 dr2 dr3 dr4 country dstruc mspec pbias evar dt1 dt2 dt3 dt4 dt5 w2;

Cluster = cluster id;                                ! Level 3: Cluster; Level 2: ID

Within = y w2;                                       ! Define within level variables

Between = (id) indonor dr1 dr2 dr3 dr4 country dstruc mspec pbias evar dt1 dt2 dt3 dt4 dt5;

                                                ! Moderators are level-2 variables

Define: w2 = SQRT(v**(-1));

        y = w2*y;

Analysis: Type=Threelevel random;

Estimator = MLR;

Model: %within%

        [y@0.0];

        y@1.0;

        f | y ON w2;                                ! Define random slope

        %between id%                                ! Level 2 variable

        f ON indonor dr1 dr2 dr3 dr4 country dstruc mspec pbias evar

            dt1 dt2 dt3 dt4 dt5;

        % between cluster%                            ! Level 3 variance

        f*;                                          ! Optional, default model

Output: sampstat; tech1; tech8;

```

The second research question in this chapter is to examine whether conducting three-level HLM SEM-based meta-analysis with FIML method to handle missing data produce equivalent results. Since the dataset I use for the meta-analysis is a full information data set with no missing data, it is not able to use the dataset to examine the effectiveness of the FIML method. To test the model effectiveness, I randomly delete 30 out of the 298 effect sizes (around 10%) in the three moderators to answer the second research question.<sup>26</sup> Thus, there are 268 effect sizes for the moderators unrelated business income, country, and education subsector, respectively. The model specification in Mplus for this examination is identical to that for the previous examination except for adding a missing data command under Variable. The command for missing data in Mplus is Missing are all (99).

There are advantages of using Mplus to conduct three-level HLM SEM-based meta-analysis. First, the program provides a single statistical modeling framework that combines a set of useful research techniques, such as structural equation modeling, multilevel models, meta-analysis, and so forth, which is powerful and convenient for researchers to address complex research questions and handle common methodological issues, such as no-

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<sup>26</sup> I generated random numbers for each effect size in an Excel sheet and ranked the numbers from the samples and largest. Then, I then selected the first 30 effect sizes for the deletion.

independence, robust results, missing data, and so on (Cheung, 2008; Muthén & Muthén, 2012). Moreover, unlike other SEM packages, Mplus has a better capacity to handle random slopes and multilevel data, which makes model results more reliable (Cheung, 2015). Thus, unless other software programs, such as LISREL, EQS, Amos, CALIS, and SEPATH, provide the same advantages, Mplus might be the best choice to conduct three-level HLM SEM-based meta-analysis.

In the next section, I report the results from the two three-level HLM SEM-based meta-analyses. The focus will be on the coefficients and standard errors of the three moderators produced by the two three-level HLM SEM-based meta-analyses. I would like to know if the coefficients and standard errors are equivalent to that produced by the GEE models run in the previous chapter.

## **Results**

Two sets of the results from the meta-analysis are presented in this section. The first set is the results from a three-level HLM SEM-based meta-analysis using a data set that is

without missing data. These results are used to compare with the results from the GEE model run in the previous chapter. The second set is the results from the meta-analysis using a data set with around 10% of randomly missing data. These results are expected to produce results equivalent to previously ones.

### **Three-Level HLM SEM-Based Meta-Analysis with No Missing Data**

The moderators used to model the variation in effect sizes for the GEE models in the previous chapter is the same as the ones used here for three-level HLM SEM-based meta-analysis. The results from the two models shown in Table 12 suggest that there are some differences in the regression coefficients and estimated standard errors between the two models. For example, the regression coefficient and estimated standard errors for *institutional donations* in the GEE model are .05 (.05) whereas in the SEM-Based model are .03 (.05). Also, the regression coefficient and estimated standard errors for *country* in the GEE model are -.21 (.11) while in the SEM-based model are -.18 (.09). Finally, the regression coefficient and estimated standard errors for *Education* in the GEE model are .07 (.03) and in the SEM-Based model are .05 (.02). These slight differences might be due to the models use different

estimation methods (quasi-likelihood in the GEE models vs maximum likelihood in the SEM-based models). Moreover, the results between these two models are almost identical if we turn our attention to significance levels. Those moderators that are (not) significant in the GEE model are (not) significant in the SEM-Based Model (Table 12). In sum, the results from the SEM-Based model make slight differences in the regression coefficients and estimated standard errors; however, they make no difference in knowing which variables explain the variation in effect sizes.

Table 12.

*GEE Models vs Three-Level HLM SEM-Based Models (No Missing Data)*

Variables	GEE Model	SEM-Based Model
<b><i>Institutional Donations</i></b>	.05 (.05)	.03 (.05)
<b><i>Commercialization (Reference: All Revenues)</i></b>		
<i>Investment Income</i>	.12 (.09)	.07 (.07)
<i>Membership Dues</i>	-.06 (.10)	-.08 (.09)
<i>Program Services Income</i>	.12 (.09)	.07 (.07)
<i>Unrelated Business Income</i>	.09~ (.05)	.06~ (.03)
<b><i>Country</i></b>	-.21** (.11)	-.18** (.09)
<b><i>Data Structures</i></b>	.22*** (.04)	.18*** (.04)
<b><i>Model Specifications</i></b>	.04 (.04)	.09 (.07)
<b><i>Publication Bias</i></b>	.12 (.08)	.09 (.07)
<b><i>Environmental Variables</i></b>	.30** (.11)	.38*** (.09)
<b><i>Organizational Types (Reference: All Orgs)</i></b>		
<i>Arts, Culture, and Humanities</i>	.10** (.04)	.11** (.03)
<i>Human Services</i>	-.01 (.04)	-.05 (.03)
<i>Health Care</i>	.10* (.04)	.11* (.05)
<i>Education</i>	.07** (.03)	.05** (.02)
<i>International Development</i>	.01 (.03)	.01 (.03)
<i>Constant</i>	-.23* (.12)	-.20* (.10)
<i>Wald <math>\chi^2</math></i>	439.37***	
<i>AIC</i>		947.25
<i>BIC</i>		1013.79

Note: Standard errors in parentheses; ~  $p \leq .10$ , \*  $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .001$

### Three-Level HLM SEM-Based Meta-Analysis with Missing Data

To demonstrate whether a model with missing data using FIML produces equivalent results, I randomly deleted 10% of the data in the moderators *institutional donors*, *country*, and *education subsector*. After the deletion, the number of the effect sizes of these three moderators is reduced to 268 from 298. The results in Table 13 suggest that there are minor differences in the regression coefficients and estimated standard errors between the SEM-based model without missing variables and the SEM-Based model with missing variables. For example, the regression coefficient and estimated standard errors for *institutional donations* in the no missing data model are .03 (.05) whereas in the 10% missing data model with FIML method are .03 (.05). Also, the regression coefficient and estimated standard errors for *country* in the no missing data model are -.18 (.09) while in the 10% missing data model with FIML method are -.13 (.06). Finally, the regression coefficient and estimated standard errors for *education* in the no missing data model are .05 (.02) and in the 10% missing data model with FIML method are .05 (.02). The regression coefficients and estimated standard errors of *institutional donations* and *education* from the two models are

identical; however, the regression coefficient for *country* is lower in the 10% missing data model with FIML method when compared to the no missing data model and the significant level shifts are observed (from  $p \leq .01$  to  $p \leq .05$ ). Most importantly, those moderators that are (not) significant in the no missing data model are (not) significant in the 10% missing data model with FIML method as well, which suggests the conclusions drawn from the results of the two modes will be the same (Table 13).<sup>27</sup>

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<sup>27</sup> The same can be said when we compare the third model with the first model in Table 13. The first model is the GEE model run in the previous chapter.



Table 13.

## GEE Models vs Three-Level HLM SEM-Based Models (with 10% Missing Data)

Variables	GEE Model	SEM-Based No Missing Data	SEM-Based 10% Random Missing Data
<b><i>Institutional Donations</i></b>	.05 (.05)	.03 (.05)	.03 (.05)
<b><i>Commercialization (Reference: All Revenues)</i></b>			
<i>Investment Income</i>	.12 (.09)	.07 (.07)	.05 (.07)
<i>Membership Dues</i>	-.06 (.10)	-.08 (.09)	-.07 (.07)
<i>Program Services Income</i>	.12 (.09)	.07 (.07)	.04 (.07)
<i>Unrelated Business Income</i>	.09~ (.05)	.06~ (.03)	.05~ (.03)
<b><i>Country</i></b>	-.21** (.11)	-.18** (.09)	-.13* (.06)
<b><i>Data Structures</i></b>	.22*** (.04)	.18*** (.04)	.18*** (.03)
<b><i>Model Specifications</i></b>	.04 (.04)	.09 (.07)	.08 (.05)
<b><i>Publication Bias</i></b>	.12 (.08)	.09 (.07)	.06 (.07)
<b><i>Environmental Variables</i></b>	.30** (.11)	.38*** (.09)	.38*** (.09)
<b><i>Organizational Types (Reference: All Orgs)</i></b>			
<i>Arts, Culture, and Humanities</i>	.10** (.04)	.11** (.03)	.10** (.03)
<i>Human Services</i>	-.01 (.04)	-.05 (.03)	-.06 (.04)
<i>Health Care</i>	.10* (.04)	.11* (.05)	.11* (.05)
<i>Education</i>	.07** (.03)	.05** (.02)	.05* (.02)
<i>International Development</i>	.01 (.03)	.01 (.03)	.03 (.03)
<i>Constant</i>	-.23* (.12)	-.20* (.10)	-.19* (.09)
<i>Wald <math>\chi^2</math></i>	439.37***		
<i>AIC</i>		947.25	3631.51
<i>BIC</i>		1013.79	3808.80

Note: Standard errors in parentheses; ~  $p \leq .10$ , \*  $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .001$

## Summaries and Discussions

This chapter has two main goals. First, it aims to compare the meta-analysis results between a GEE model and three-level HLM SEM-based model to investigate whether the results are equivalent. If the results are equivalent or if there are merely minor differences between the model results, Ringquist's (2013) concerns over the performance of the three-level HLM meta-analysis are overstated. Second, it aims to demonstrate whether FIML method is an effective approach in handling meta-analysis data sets with missing data by using three-level HLM SEM-based models. As Cooper and Hedges (2009) observe that missing data issue is the most pervasive issue in meta-analysis; therefore, an effective method to handle missing data is necessary. Many methods have been proposed to handle missing data and the use of FIML has demonstrated less biased results in many applications (Enders, 2010), but the effectiveness of the use of FIML to handle missing data in three-level HLM SEM-based meta-analysis and the comparison of the results between the GEE models and SEM-based models have not been demonstrated in the literature, to my knowledge. By randomly deleting 10% of the data, I compare if the results from the no missing data model are equivalent to the results from the missing data model. Similarly, if the results are

equivalent or if there are merely minor differences between the models, the application of FIML to three-level HLM SEM-based models is believed to produce reliable results.

For both of the questions of interest, the results in this chapter suggest that there are minor differences in the regression coefficients and estimated standard errors; moreover, the significance level of each moderator (i.e., independent variables in meta-regression models) is almost equivalent between the models. Therefore, I conclude that three-level HLM SEM-based models and the application of FIML to the models in meta-analysis are able to produce reliable results in terms of identifying variables that account for the variation in effect sizes. Moreover, although the results demonstrate minor differences in the regression coefficients and estimated standard errors between the models, these differences, in this case, would not affect the interpretations of the effect of commercialization on nonprofit donations. This, however, does not mean that the differences between models, in other cases, would not affect researchers' explanations of the research questions of interest. More studies to investigate the reliability of the results from three-level HLM SEM-based models and the applications of FIML method to the models are required.

Overall, three-level HLM SEM-based models and FIML method are able to produce reliable results in meta-analysis. The implications are twofold. First, one more approach is available for field members to conduct meta-analysis. In Ringquist's (2013) seminal book of meta-analysis, he compares two-level HLM models with GEE and CRVE models and concludes that the latter two models are preferable over the former model when conducting meta-analysis. Ringquist (2013) emphasizes that two-level HLM models have several shortcomings and these shortcomings are not able to be resolved even when the two-level models are extended to three-level models (Ringquist, 2013). The most direct consequence of having these shortcomings is that the results from HLM models are not reliable. Existing meta-analyses follow Ringquist (2013) and use GEE and CRVE models (Hung & Hager, 2018; Lu, 2016; Lu, 2018). The results from this study, however, contradicts the assertions of Ringquist (2013) and argues that three-level HLM SEM-based models could be used in meta-analysis to produce reliable results. Second, the results from this study suggest that original studies with missing data could be included in meta-analyses. Traditionally, meta-analysts exclude original studies with missing data. The main reason for the exclusion is the concern of producing biased results when traditional methods of dealing missing data, such as listwise deletion, pairwise deletion, or mean substitution, are employed. However, the exclusion of

original studies with missing data itself might produce biased results. Therefore, a reliable method to handle missing data is necessary. The results from this study demonstrate that the use of three-level HLM SEM-based models with the application of FIML is able to produce equivalent results. The implication is that meta-analysts could include original studies with missing data without worrying about producing unreliable and invalid results.

## CHAPTER 5

### THE POTENTIAL OF META-ANALYSIS IN ADVANCING KNOWLEDGE IN NONPROFIT AND PUBLIC MANAGEMENT RESEARCH

On one hand, scholars enter the field of organizational science because it encourages pluralism. On the other hand, pluralism has impeded knowledge advancement, which in turn makes some organizational scientists question the value of their own research. Specifically, pluralism has made consensus difficult on many research questions and topics in organizational science. It is because that field members employ different research methods, use different data, take discrete concept measurements, and study distinct types of organizations and individuals to study the same research questions and topics having produced inconsistent or contradictory results that fail knowledge aggregation and advancement. Reaching consensus serves as a necessary condition for knowledge advancement (Pfeffer, 1993). Consensus building can be achieved through conducting meta-analysis to summarize mixed results. In other words, knowledge has to be accumulated (i.e., reach consensus on where we stand in a field) before it can be advanced (i.e., explore what has not yet been known and where we should be going).

In the following sections, I first discuss why meta-analysis holds promise for knowledge aggregation and then I elaborate why meta-analysis has potential to advance knowledge in NPM by using the meta-analysis of the relationship between

commercial revenues and nonprofit donations and other meta-analyses in NPM as examples.

### **The Promise of Meta-analysis in Knowledge Aggregation**

Knowledge aggregation is a process of collecting information from heterogeneous sources and grouping the information into a unified base. Meta-analysis enables knowledge aggregation by facilitating consensus building on studies that produce inconsistent or even contradictory findings. For example, many scholars are concerned with whether education brochures are effective in improving students' academic performance. The problem is that studies that focus on this issue produce mixed results; some studies find the brochures are effective while others find the brochures are ineffective. This demonstrates a need for scholars to build consensus about the effectiveness of issuing education brochures to increase students' performance through conducting a meta-analysis. The results from the meta-analysis offer a weighted mean effect size that summarizes the seemingly disparate research results into an aggregate relationship. The weighted mean effect size derived from existing literature represents the state of knowledge that helps field members establish a consensus on the effectiveness of the brochures. Below I offer examples of building consensus through conducting meta-analysis.

First, meta-analysis is able to facilitate the building of consensus by increasing the precision of policy effectiveness estimates. In the 1970s and 1980s, there was a

heated debate over whether government spending on education increases student achievement. On one hand, the public and school teachers believed that more spending would increase school performance, so they urged government agencies to increase education budgets. On the other hand, empirical studies on this topic demonstrated contradictory results, which made policy makers confused about the effectiveness of the spending. Eric A. Hanushek was one of the most influential scholars among those who insisted that more spending does not increase student achievement. In 1981, he published a paper in the *Journal of Policy Analysis and Management* regarding his findings that throwing money at schools does no good (Hanushek, 1981). This finding made Hanushek a hero to conservatives; he was constantly invited for the defense at hearings and courts as an expert witness to fight against citizen groups who believed in the positive effect of education budgets on student achievement (Hunt, 1997).

In 1989, Hanushek published his most influential article yet “The Impact of Differential Expenditures on School Performance” repeatedly stating that money doesn’t matter. Hanushek’s perspectives on the issue bothered many educators, parent groups, and policy makers. When challenged by those distressed people, the then Secretary of Education had been saying, “Hanushek shows that money does not matter and do not throw more money down the drain” (Hunt, 1997, p.55). Although Hanushek exerted a huge influence on school finance policies, Richard Laine, an education policy reformer and then graduate student, was certain that Hanushek’s idea did not make sense and there must be something wrong with the analysis, especially



after knowing that the conclusions drawn by Hanushek was based on the use of a vote-counting method to research the issue.<sup>28</sup> The vote-counting method of reviewing relevant studies has been discouraged by methodologists as it often produces wrong conclusions. Instead, Laine attempted to use meta-analysis, which he considered a more trustworthy, informative, and precise method that reduces sampling error, bolsters statistical power, and enhances the generalizability of effect sizes.

Using meta-analysis techniques to summarize the results of the studies reviewed by Hanushek, Laine and his colleagues found that Hanushek's data do not support his analysis. Rather, the relationship is the opposite: money matters. Their paper was published in *Educational Researchers* in 1994. They concluded that "there is evidence of statistically reliable relations between educational resource inputs and school outcomes, and there is much more evidence of positive relations than of negative relations between resource inputs and outcomes" (Hedges, Laine, & Greenwald, p.11). Most importantly, their effect size analysis revealed that "students in a school that raised per pupil expenditure by \$500 would enjoy a nearly 24 percent increase in achievement compared with similar students in a school that pursued no spending increase" (Hunt, 1997, p.66). Hanushek's first reaction to the meta-analysis publication was: "(a) more sophisticated is not synonymous with correct, and (b) their interpretation is potentially very misleading when it comes to policy matters"

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<sup>28</sup> People would conclude that the relationship between the variables of interest is positive if they found the number of positive relationship papers they review greater than the number of negative relationship papers they review.

(Hanushek, 1994, p.5). However, not too long after the debate, Hanushek begun to say, “we need to focus on the ways in which money does matter.”

Additionally, meta-analysis is able to facilitate the building of consensus by increasing the precision of the estimations of the relationships between variables of interests. For example, nonprofits rely on different revenue sources: private donations, government funding, and commercial revenues. The interactions among the revenue sources may affect financial stability and sustainability. Over the past three decades, many studies have been dedicated to the question of whether government funding crowds out private donations. Steinberg (1985, 1997) found partial evidence of the crowding-out hypothesis. Payne (2009) concluded that crowd-out exists under certain conditions. In his review of 46 studies, Tinkelman (2010) demonstrated that the results from the studies vary tremendously; the effects depend on several factors. These findings raise a variety of questions regarding the crowding-out hypothesis. Among the questions confronted are: dose the crowding-out effect exist overall? What are the exact estimated relationships between government funding and private donations under various conditions?

These questions were addressed by de Wit and Bekkers (2017), who employed meta-analysis to summarize the research findings and to estimate the crowding-out effects. De Wit and Bekkers’ (2017) review of 20 experimental studies and 49 non-experimented studies revealed that overall a \$1 increase in government funding is associated with a \$0.17 decrease in private donations across all studies. That is, the

crowd-out effect exists. However, there was a significant effect size difference between research methods that were used in the primary studies. Primary studies that use an experimental design to examine the hypothesis are more likely, on average, to find negative associations than studies that use non-experimented design. Specifically, de Wit and Bekkers' (2017) found \$1 increase in government funding is associated with an average \$0.64 *decrease* in private donations in experimental studies; however, the association is opposite in the unexperimented studies: a \$1 increase in government funding is associated with an average \$0.06 *increase* in private donations. In short, de Wit and Bekkers' (2017) meta-analysis offered more precise estimations of the relationships between government funding and private donations and made field members aware of the overall and subgroup associations. Also, the analysis demonstrated that the difference in effect sizes is due primarily to research methods used in original studies.

Moreover, in the case of the relationship between commercialization and nonprofit donations, the effect sizes produced by original studies range from -.90 to .15. The heterogeneity in effect sizes could be attributed to differences in sample selection, sample size, variable measures of original studies. Despite of focusing on the same research questions, A study might use a sample of hospital nonprofits with a large sample size to examine the relationship between unrelated business income and private donations whereas B study might use a sample of human service nonprofits with a small sample size to test the relationship between the program service revenues and total donations. Thus, when it comes to the overall relationship between

commercial revenues and nonprofit donations, especially when the discussion focuses on whether commercial revenues crowd out nonprofit donations, field members hardly have a clear idea of what the overall effect is. The issue, however, is able to be solved by using meta-analysis techniques to combine heterogeneous effect sizes into a mean effect weighted by sample sizes of original studies to estimate the expected population effect size. In the previous chapters, the results from the meta-analysis demonstrate that the average effect size is -.03. The effect size serves as a unified value for entire body of literature on the relationship.

Third, meta-analysis is able to facilitate the building of consensus by informing theory explanation. Perry and Hondeghem (2008, vii) defined public service motivation (PSM) as “an individual’s orientation to delivering services to people with a purpose to do good for others and society.” Research on PSM has grown rapidly over the past two decades. Many organizational factors are found to be associated with PSM; however, empirical studies on the relationships have frequently found inconsistent or contradictory results, which challenge our understanding of PSM theory (Harari, Herst, Parola, & Carmona, 2016). For example, built on Merton (1940), many studies have found evidence to suggest that the relationship between organizational tenure and PSM is negative. They explained that “members who joined an organization with a strong commitment to public service may find themselves increasingly frustrated as time passes, as their hopes to contribute are dashed” (Moynihan & Pandey, 2007, p.44). However, some studies have found that the relationship to be positive (Camilleri, 2007). Harari et al., (2016) used meta-analysis

to summarize the research findings and concluded that, overall, the relationship is null. This finding calls the dominant explanation (i.e., the negative association) into question and reshapes the understanding of PSM theory.

In the nonprofit sector, revenue diversification has been considered as a cushion strategy for nonprofits to fight against financial instability and uncertainty (Kingma, 1993; Tuckman & Chang, 1991). Research has frequently drawn upon Markowitz's (1952) theoretical framework, suggesting that revenue diversification increases organizational financial health. Built on Markowitz (1952), some empirical studies indeed have found positive relationships while others have demonstrated negative relationships (Carroll & Stater, 2009; Chikoto-Schultz & Neely, 2016; Greenlee & Trussel, 2000; Hager, 2001; Prentice, 2016; Wicker & Breuer, 2013). Hung and Hager's (2018) meta-analysis synthesized the contradictory results and concluded that, overall, revenue diversification holds value for nonprofit financial health and that the existing literature supports the practice of balancing diverse revenue streams, which is also the spirit of Markowitz's modern portfolio theory.

Scattered knowledge is more likely to be aggregated in NPM when field members reach consensus on unsolved questions such as whether more spending on education increases student achievement (i.e., policy effectiveness), the exact magnitude of government funding crowd-out effect on private donations (i.e., effect size estimation), and whether modern portfolio theory can be applied to explaining resource allocation strategy implemented by nonprofits (i.e., theory explanation).

Meta-analysis holds promise for knowledge aggregation by offering a clear-cut average effect size on unsolved questions, which in turn provides field members a basic understanding of where we stand and what has been known in the field.

### **The Potential of Meta-analysis in Knowledge Advancement**

Knowledge aggregation aside, there is a debate over whether meta-analysis plays a role in the advancement of knowledge (Chan & Arvey, 2012). Two main points have been raised by those who doubt its role in knowledge advancement. First, some scholars have argued that meta-analysis merely serves as a tool to summarize extant literature in a field; it is not useful for scientific discoveries (Guzzo, Jackson, & Katzell, 1987; Hoyle, 1993). Second, other scholars are concerned with whether a meta-analysis exerts a chilling effect that inhibits field members from further research in an area. For example, Slavin (1984) expressed, “I feel a serious danger posed by the widespread use of meta-analysis is that it may discourage further research in the area synthesized” (p. 13). Such concerns, however, might be exaggerated. In general, meta-analysis’ contribution to knowledge advancement is trivial only when the variation in effect size is small. However, this situation has rarely happened in the field of NPM. In most cases in the field of NPM, meta-analyses are able to advance knowledge through meta-regression analyses (i.e., moderator analyses). Specifically, meta-analysis has potential to advance knowledge development in a field through identifying moderators, which in turn guides future research into a fruitful direction. Meta-analysis techniques, in many cases, allow researchers to identify which

measure, technique, data, or theory is better than others to advance our understanding of a phenomena. Once the usefulness of a certain measure, technique, data, or theory is revealed by a meta-analysis, subsequent studies might follow the meta-analysis' suggestions to further explore uncharted knowledge fields. For example, Gerstner and Day's (1997) meta-analysis of the relationships between leader-member exchange (LMX) and its correlates indicated that the LMX-7 measure has the soundest psychometric properties among all LMX measures. After that, many subsequent studies followed their suggestions and used the LMX-7 measure for their own studies to further our understanding of LMX theory (Chan & Arvey, 2012). In this case, meta-analysis advanced knowledge development by indicating which measure is useful and suggesting the directions in which the field could move.

The same can be said for Harari, Herst, Parola, and Carmona's (2016) meta-analysis of organizational correlates of public service motivation (PSM). In their study, they included national context as a moderator of the relationships examined and found there were significant differences between Anglo nations and Germanic European nations. For example, the relationship between PSM and organizational tenure is found to be stronger in Germanic European nations than in Anglo nations. Also, the relationship between PSM and career success is stronger in Germanic European nations than in Anglo nations. On the basis of these findings, Harari et al., (2016) suggest that more fruitful findings can be obtained if future research on the relationships is devoted to the Germanic European context. Although it is too early to tell whether subsequent studies will follow their suggestions, their study clearly points

out directions for future research efforts, which has potential to advance our understanding of PSM theory.

Moreover, the meta-regression results from the meta-analysis of the influence of commercial revenues on nonprofit donations reveal that unrelated business income, on average, returns more positive effects than other revenue streams; the United States nonprofits, on average, return more negative effects than nonprofits in other countries; and commercial nonprofits, on average, returns more positive effects than donative nonprofits. These discoveries offer new perspectives in the literature with evidence-based results. These findings could be revealed through using meta-regression techniques; however, they are not easily to be found when we conduct micro-level studies where the attention has always been paid to the linear relationship between the variables, where data on unrelated business income are not always available, where cross-national comparisons are time-consuming and expensive, and where the focus tends to be on a certain types of nonprofits.

Most importantly, significant moderators, in some cases, not only reveal differences in effect sizes between or among categories, but also challenge conventional wisdom that has been accepted for a long time. An unexpected finding in the meta-analysis of the relationship between commercial revenues and nonprofit donations is that unrelated business income, on average, returns more positive effects. The result suggests, other things held constant, that unrelated business income crowds in nonprofit donations. This finding challenges Herman and Rendina's (2001) notion



that nonprofits with unrelated business income are more likely to receive less donations (i.e., crowding out effect) due to donors' aversion toward nonprofit commercialization. This finding also suggests that field members should take a step back and have a balanced view when studying or discussing nonprofit commercialization. That is, previous discussion on nonprofit commercialization focuses too much on donors' perspectives and ignores the organizational perspectives that emphasize the importance of financial flexibility and autonomy brought in to organizations by engaging in unrelated business activities and having income from the activities.

Secondly, a meta-analysis represents a knowledge map in a field, which informs field members what has not yet been known and urges field members to devote efforts to the uncharted territories (Chan & Arvey, 2012). For example, in their meta-analysis of nonprofit revenue diversification, Hung and Hager (2018) suggested that future research could benefit from attention to the influence of forces, such as organizational autonomy, risk-tolerance, and community embeddedness, that has been identified by the existing literature as potential influential factors in explaining the relationship between revenue diversification and nonprofit financial health. Future research can examine whether organizational autonomy is an underlying mechanism of the relationship through mediation analysis. Such examinations are considered as a crucial step for the development of knowledge and theory about nonprofit resource allocation.

Meta-analysis can also inform field members regarding what information has been missing in the literature that prohibits meta-analysts from advancing knowledge in a field. Cantarelli, Belardinelli and Belle's (2016) meta-analysis of job satisfaction correlates noted that the degree to which a meta-analysis advances knowledge in a field is associated with the ways field members use them to conduct and present primary studies. After reviewing 99 studies on the relationships of job satisfaction and 43 correlates, they urged future research to: (1) provide detailed information about research designs and methods; (2) use validated measurement scales; (3) and employ different quantitative designs. These efforts, if enacted, will benefit the field when the next meta-analysis about job satisfaction correlates is conducted to provide more comprehensive and precise review of the literature. This function again suggests that meta-analysis would not discourage further research in a field synthesized. Instead, it demonstrates what else has to be done in order to move a field forward.

Finally, a well-conducted meta-analysis can reduce sampling error, bolster statistical power, and enhance the generalizability of effect sizes, which provides valid and reliable research results (Hunter & Schmidt, 2004). Researchers and policy makers have been interested in knowing whether existing predictions are supported by meta-analysis. Eyebrows are raised when results from meta-analysis challenge existing discourses. The "revolutions" have potentials to change our view of a phenomena. For instance, Smith and Glass's (1977) meta-analysis on psychotherapy outcomes garnered a great deal of research attention when their results demonstrated

the efficacy of various psychotherapies, which challenged conventional wisdom that psychotherapy is ineffective. Their meta-analysis has changed the practice of clinical psychology and was selected as one of the 40 studies that changed psychology (Hock, 1995). In other words, the meta-analysis has advanced knowledge development of psychotherapy.

The results of Lu's (2018) meta-analysis challenge conventional thinking that government funding suppresses nonprofit political activity. The suppression arguments are easily digested by scholars and practitioners: nonprofits are not likely to bite the hand that feeds them. That is, nonprofit organizations with government funding are thought less likely to engage in political activities that sometimes results in conflicts with governments. Wolch (1990) observed that "as public funding becomes more central to organizational survival, these groups may be essentially co-opted and become quiescent" (p. 215). Also, in order to obtain government funding, nonprofits might be devoted to meeting government requirements rather than increasing policy advocacy engagement. In a highly competitive environment, nonprofits "must respond and adapt to changing government policies that emphasize contracting out, devolution, and privatization, . . . which forces them to shift from a value-driven calculus to one driven by efficiency" (Hasenfeld & Garrow, 2012, p. 302). Despite the fact that these suppression arguments are strong, Lu's analysis of 38 original studies on the relationship found that government funding does not crowd out nonprofit policy activity and suggested that nonprofit professionals should not view government funding as a barrier for engagement in political activity.

Given the examples discussed above, I demonstrate that meta-analysis is a useful tool for knowledge advancement and scientific discoveries. It is not merely a tool to summarize extent literature. It advances knowledge in a variety of ways. Also, meta-analysis need not discourage further research in the area synthesized. Instead, it directs further research to fruitful research areas and encourages further research to explore uncharted knowledge territories. Therefore, it is not desirable to debate over whether meta-analysis plays a role in the advancement of knowledge. The debate could move forward to consider what roles meta-analysis play in advancing knowledge. One productive discussion question could be how meta-analysis directly and indirectly contributes to knowledge advancement. For example, we know from the above examples that meta-analysis can directly contribute to knowledge advancement by indicating that national context plays a role in explaining the relationship between PSM and organizational tenure. Also, it indirectly contributes to knowledge advancement by suggesting that future study could examine underlying effects, such as organizational autonomy, risk-tolerance, and community embeddedness, between the relationship of revenue diversification and nonprofit financial health to better understand nonprofits' resource allocation strategy (Harari et al., 2016; Hung & Hager, 2018).

## Conclusions

There is no single paradigm that dominates the existing body of organization science research. Organizational scientists embrace the differences in ontology, epistemology, and methodology, and use different measures, theories, and techniques to study the same topics or questions. Multiple paradigms exist in the field. The pluralism, on one hand, has attracted many young talents into the organization sciences sphere; on the other hand, pluralism, in many cases, has also hindered knowledge advancement in the field. The first step in advancing knowledge in the field is to reach a consensus on a question that has produced mixed results due to the pluralism (Pfeffer, 1993). Traditional literature review has been a popular approach among scholars to synthesize research findings. It, however, has its own limitations and biases in summarizing research results and contributing to knowledge advancement.

The use of meta-analyses is able to fill this gap in two steps. First, meta-analysis summarizes heterogeneous results into a clear-cut statistic to inform field members about the overall relationship between the variables of interest. This effort offers promising starting points for productive debate over controversial issues. It can be readily achieved by putting heterogeneous results together. It also echoes the notion that consensus building is the first step of facilitating knowledge advancement. Second, meta-analysis provides a set of techniques to explain the variation in heterogeneous results to make field members understand the relationships of interests

under different conditions. This effort, combined with the result from the first step, moves our understanding of the inconclusive relationships forward, opening new perspectives in the literature with evidence-based results. Meta-analysis is especially useful in organization science where variation in effect sizes is abundant.

Therefore, embracing pluralism in organization sciences should not be an issue as long as there is a research method available for field members to examine and explain the variation in research results. With the availability of meta-analysis, pluralism in organization sciences could be viewed as a sign of the health of the discipline rather than a sign of immaturity of the discipline.

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APPENDIX A

[ARTICLES INCLUDED IN THE META-ANALYSIS OF  
COMMERCIALIZATION AND NONPROFIT CAPACITY]

NO.	Articles
1	Andreoni, J., & Payne, A. A. (2011). Is crowding out due entirely to fundraising? Evidence from a panel of charities. <i>Journal of public Economics</i> , 95(5-6), 334-343.
2	Baba, H., Ishida, Y., & Okuyama, N. (2014). Revenue Strategies and Financial Viability for Emerging Nonprofit Sector in Japan: Commercialization or Diversification?.
3	Breman , A. 2006 . “ The Economics of Altruism, Paternalism and Self-Control .” PhD diss., Stockholm School of Economics , Stockholm, Sweden .
4	Brooks, A. C. (2003). Taxes, subsidies, and listeners like you: Public policy and contributions to public radio. <i>Public Administration Review</i> , 63(5), 554-561.
5	Callen, J. L. (1994). Money donations, volunteering and organizational efficiency. <i>Journal of Productivity Analysis</i> , 5(3), 215-228.
6	Duquette, N. J. (2017). Spend or Save? Nonprofits' Use of Donations and Other Revenues. <i>Nonprofit and Voluntary Sector Quarterly</i> , 46(6), 1142-1165.
7	Ecer, S., Magro, M., & Sarpça, S. (2017). The relationship between nonprofits' revenue composition and their economic-financial efficiency. <i>Nonprofit and Voluntary Sector Quarterly</i> , 46(1), 141-155.
8	Enjolras, B. (2002). The commercialization of voluntary sport organizations in Norway. <i>Nonprofit and voluntary sector quarterly</i> , 31(3), 352-376.
9	Hager, M. A., Galaskiewicz, J., & Larson, J. A. (2004). Structural embeddedness and the liability of newness among nonprofit organizations. <i>Public Management Review</i> , 6(2), 159-188.
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11	Herzer, D., & Nunnenkamp, P. (2013). Private donations, government grants, commercial activities, and fundraising: Cointegration and causality for NGOs in international development cooperation. <i>World Development</i> , 46, 234-251.
12	Howard, D. B. (2013). <i>Human services in a market economy: Implications of program fee reliance among nonprofit human service organizations</i> (Doctoral dissertation, UCLA).
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14	Hughes, P., Luksetich, W., & Rooney, P. (2014). Crowding-Out and Fundraising Efforts: The Impact of Government Grants on Symphony Orchestras. <i>Nonprofit Management and Leadership</i> , 24(4), 445-464.
15	Jacobs, F. A., & Marudas, N. P. (2006). Excessive, optimal, and insufficient fundraising among the Nonprofit Times 100. <i>International Journal of Nonprofit and Voluntary Sector Marketing</i> , 11(2), 105-114.



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- 18 Khanna, J., Posnett, J., & Sandler, T. (1995). Charity donations in the UK: New evidence based on panel data. *Journal of Public Economics*, 56(2), 257-272.
- 19 Kim, M. (2017). The relationship of nonprofits' financial health to program outcomes: Empirical evidence from nonprofit arts organizations. *Nonprofit and Voluntary Sector Quarterly*, 46(3), 525-548.
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- 22 Krawczyk, K., Wooddell, M., & Dias, A. (2017). Charitable Giving in Arts and Culture Nonprofits: The Impact of Organizational Characteristics. *Nonprofit and Voluntary Sector Quarterly*, 46(4), 817-836.
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- 37 Suárez, D. F., & Hwang, H. (2013). Resource constraints or cultural conformity? Nonprofit relationships with businesses. *Voluntas: International Journal of Voluntary and Nonprofit Organizations*, 24(3), 581-605.
- 38 Tinkelman, D., & Neely, D. G. (2011). Research note: Some econometric issues in studying nonprofit revenue interactions using NCCS data. *Nonprofit and Voluntary Sector Quarterly*, 40(4), 751-761
- 39 Wicker, P., Breuer, C., & Hennigs, B. (2012). Understanding the interactions among revenue categories using elasticity measures—Evidence from a longitudinal sample of non-profit sport clubs in Germany. *Sport Management Review*, 15(3), 318-329.
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APPENDIX B

[ARTICLES INCLUDED IN THE META-ANALYSIS OF  
COMMERCIALIZATION AND NONPROFIT DONATIONS]

NO.	Articles
1	Andreoni, J., & Payne, A. A. (2011). Is crowding out due entirely to fundraising? Evidence from a panel of charities. <i>Journal of public Economics</i> , 95(5-6), 334-343.
2	Bremán, A. (2006). "The Economics of Altruism, Paternalism and Self-Control." PhD diss., Stockholm School of Economics, Stockholm, Sweden.
3	Brooks, A. C. (2003). Taxes, subsidies, and listeners like you: Public policy and contributions to public radio. <i>Public Administration Review</i> , 63(5), 554-561.
4	Callen, J. L. (1994). Money donations, volunteering and organizational efficiency. <i>Journal of Productivity Analysis</i> , 5(3), 215-228.
5	Enjolras, B. (2002). The commercialization of voluntary sport organizations in Norway. <i>Nonprofit and voluntary sector quarterly</i> , 31(3), 352-376.
6	Herzer, D., & Nunnenkamp, P. (2013). Private donations, government grants, commercial activities, and fundraising: Cointegration and causality for NGOs in international development cooperation. <i>World Development</i> , 46, 234-251.
7	Hughes, P., Luksetich, W., & Rooney, P. (2014). Crowding-Out and Fundraising Efforts: The Impact of Government Grants on Symphony Orchestras. <i>Nonprofit Management and Leadership</i> , 24(4), 445-464.
8	Jacobs, F. A., & Marudas, N. P. (2006). Excessive, optimal, and insufficient fundraising among the Nonprofit Times 100. <i>International Journal of Nonprofit and Voluntary Sector Marketing</i> , 11(2), 105-114.
9	Khanna, J., & Sandler, T. (2000). Partners in giving:: The crowding-in effects of UK government grants. <i>European Economic Review</i> , 44(8), 1543-1556.
10	Khanna, J., Posnett, J., & Sandler, T. (1995). Charity donations in the UK: New evidence based on panel data. <i>Journal of Public Economics</i> , 56(2), 257-272.
11	Kingma, B. R. (1995). Do profits "crowd out" donations, or vice versa? The impact of revenues from sales on donations to local chapters of the American Red Cross. <i>Nonprofit Management and Leadership</i> , 6(1), 21-38.
12	Krawczyk, K., Wooddell, M., & Dias, A. (2017). Charitable Giving in Arts and Culture Nonprofits: The Impact of Organizational Characteristics. <i>Nonprofit and Voluntary Sector Quarterly</i> , 46(4), 817-836.
13	Levine Daniel, J. (2014). Mission-Based Objectives, Market-Based Funding: The Relationship between Earned Revenue and Charitable Mission (Doctoral dissertation, The Ohio State University).
14	Marudas, N. P., & Jacobs, F. A. (2004). Determinants of charitable donations to large US higher education, hospital, and scientific research NPOs: New evidence from panel data. <i>Voluntas: International Journal of Voluntary and Nonprofit Organizations</i> , 15(2), 157-179.
15	Okten, C., & Weisbrod, B. A. (2000). Determinants of donations in private nonprofit markets. <i>Journal of public economics</i> , 75(2), 255-272.

- 16 Posnett, J., & Sandler, T. (1989). Demand for charity donations in private non-profit markets: The case of the UK. *Journal of Public economics*, 40(2), 187-200.
  - 17 Segal, L. M., & Weisbrod, B. A. (1998). Interdependence of commercial and donative revenues. In B. E. Weisbrod (Ed.), *To profit or not to profit: The commercial transformation of the nonprofit sector* (pp. 105–127). Cambridge: Cambridge University Press."
  - 18 Smith, T. M. (2003). The effect of NEA grants on the contributions to nonprofit dance companies. *The Journal of Arts Management, Law, and Society*, 33(2), 98-113.
  - 19 Smith, T. M. (2007). The impact of government funding on private contributions to nonprofit performing arts organizations. *Annals of public and cooperative economics*, 78(1), 137-160.
  - 20 Stone, M. M., Hager, M. A., & Griffin, J. J. (2001). Organizational characteristics and funding environments: A study of a population of United Way–affiliated nonprofits. *Public Administration Review*, 61(3), 276-289.
  - 21 Suárez, D. F., & Hwang, H. (2013). Resource constraints or cultural conformity? Nonprofit relationships with businesses. *Voluntas: International Journal of Voluntary and Nonprofit Organizations*, 24(3), 581-605.
  - 22 Tinkelman, D., & Neely, D. G. (2011). Research note: Some econometric issues in studying nonprofit revenue interactions using NCCS data. *Nonprofit and Voluntary Sector Quarterly*, 40(4), 751-788
  - 23 Wicker, P., Breuer, C., & Hennigs, B. (2012). Understanding the interactions among revenue categories using elasticity measures—Evidence from a longitudinal sample of non-profit sport clubs in Germany. *Sport Management Review*, 15(3), 318-329.
  - 24 Wilsker, A. L. 2011. "The Determinants of Private Contributions and Government Grants to Nonprofit Organizations." PhD diss., Georgia State University, Department of Economics, Atlanta, GA.
  - 25 Yetman, M. H., & Yetman, R. J. (2003). The effect of nonprofits' taxable activities on the supply of private donations. *National Tax Journal*, 243-258.
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## APPENDIX C

[CODING INFORMATION FOR THE META-ANALYSIS OF THE  
RELATIONSHIP BETWEEN COMMERCIALIZATION AND NONPROFIT  
DONATIONS AND THE WEIGHTED EFFECT SIZE CALCULATION]

<b>Background Information</b>							
<b>No.</b>	<b>Article</b>	<b>Authors</b>	<b>Year</b>	<b>Data Year Coverage</b>	<b>Data Source</b>	<b>Sample</b>	<b>Country</b>
1	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
2	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
3	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
4	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
5	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
6	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
7	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
8	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
9	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
10	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
11	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
12	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
13	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
14	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
15	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
16	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
17	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
18	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
19	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
20	1	Levine Daniel	2014	2007 - 2010	Cultural Data Project	8460	US
21	2	Herzer and Nunnenkamp	2013	1983–2005	Other Paper	1173	US
22	2	Herzer and Nunnenkamp	2013	1983–2005	Other Paper	1173	US
23	2	Herzer and Nunnenkamp	2013	1983–2005	Other Paper	1173	US
24	2	Herzer and Nunnenkamp	2013	1983–2005	Other Paper	1173	US

25	2	Herzer and Nunnenkamp	2013	1983–2005	Other Paper	1173	US
26	2	Herzer and Nunnenkamp	2013	1983–2005	Other Paper	1173	US
27	2	Herzer and Nunnenkamp	2013	1983–2005	Other Paper	1265	US
28	2	Herzer and Nunnenkamp	2013	1983–2005	Other Paper	1035	US
29	2	Herzer and Nunnenkamp	2013	1983–2005	Other Paper	276	US
30	2	Herzer and Nunnenkamp	2013	1983–2005	Other Paper	1127	US
31	2	Herzer and Nunnenkamp	2013	1983–2005	Other Paper	874	US
32	2	Herzer and Nunnenkamp	2013	1983–2005	Other Paper	345	US
33	2	Herzer and Nunnenkamp	2013	1983–2005	Other Paper	1173	US
34	2	Herzer and Nunnenkamp	2013	1983–2005	Other Paper	1173	US
35	3	Stone, Hager, and Griffin	2001	1994	UWMB	191	US
36	3	Stone, Hager, and Griffin	2001	1994	UWMB	150	US
37	3	Stone, Hager, and Griffin	2001	1994	UWMB	150	US
38	3	Stone, Hager, and Griffin	2001	1994	UWMB	191	US
39	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 990	298	US
40	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 991	298	US
41	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 992	298	US
42	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 993	298	US
43	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 994	298	US
44	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 995	464	US
45	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 996	464	US
46	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 997	464	US
47	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 998	464	US
48	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 999	464	US
49	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1000	112	US



50	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1001	112	US
51	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1002	112	US
52	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1003	112	US
53	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1004	112	US
54	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1005	187	US
55	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1006	187	US
56	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1007	187	US
57	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1008	187	US
58	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1009	187	US
59	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1010	293	US
60	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1011	293	US
61	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1012	295	US
62	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1013	295	US
63	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1014	295	US
64	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1015	295	US
65	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1016	463	US
66	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1017	463	US
67	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1018	462	US
68	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1019	462	US
69	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1020	464	US
70	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1021	464	US
71	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1022	111	US
72	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1023	111	US
73	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1024	112	US
74	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1025	112	US
75	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1026	109	US
76	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1027	109	US

77	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1028	187	US
78	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1029	187	US
79	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1030	182	US
80	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1031	182	US
81	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1032	187	US
82	4	Yetman and Yetman	2003	1992-1995	IRS 990T and IRS 1033	187	US
83	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	123293	US
84	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	2906	US
85	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	11438	US
86	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	4720	US
87	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	2781	US
88	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	669	US
89	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	2710	US
90	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	2502	US
91	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	2111	US
92	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	21764	US
93	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	989	US
94	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	293	US
95	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	641	US
96	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	287	US
97	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	123293	US
98	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	2906	US
99	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	11438	US
100	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	4720	US
101	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	2781	US
102	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	669	US
103	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	2710	US

104	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	2502	US
105	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	2111	US
106	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	21764	US
107	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	989	US
108	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	293	US
109	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	641	US
110	5	Tinkelman and Neely	2011	2001-2003	NCCS digitized data	287	US
111	6	Posnett and Sandler	1989	1985	Chatiries Aid Foundation	299	UK
112	6	Posnett and Sandler	1989	1985	Chatiries Aid Foundation	299	UK
113	6	Posnett and Sandler	1989	1985	Chatiries Aid Foundation	299	UK
114	6	Posnett and Sandler	1989	1985	Chatiries Aid Foundation	105	UK
115	6	Posnett and Sandler	1989	1985	Chatiries Aid Foundation	36	UK
116	6	Posnett and Sandler	1989	1985	Chatiries Aid Foundation	37	UK
117	6	Posnett and Sandler	1989	1985	Chatiries Aid Foundation	121	UK
118	7	Wicker, Breuer, and Hennigs	2012	2009 and 2009	Sports Development Report	5026	Germany
119	7	Wicker, Breuer, and Hennigs	2012	2010 and 2009	Sports Development Report	5026	Germany
120	8	Andreoni and Payne	2011	1985-2002	NCCS	2339	US
121	8	Andreoni and Payne	2011	1985-2002	NCCS	2339	US
122	8	Andreoni and Payne	2011	1985-2002	NCCS	2339	US
123	8	Andreoni and Payne	2011	1985-2002	NCCS	2339	US
124	8	Andreoni and Payne	2011	1985-2002	NCCS	2339	US
125	8	Andreoni and Payne	2011	1985-2002	NCCS	2339	US
126	8	Andreoni and Payne	2011	1985-2002	NCCS	2339	US
127	8	Andreoni and Payne	2011	1985-2002	NCCS	2339	US
128	9	Okten and Weisbrod	2000	1982 -1994	NCCS SOI	228	US
129	9	Okten and Weisbrod	2000	1982 -1994	NCCS SOI	290	US

130	9	Okten and Weisbrod	2000	1982 -1994	NCCS SOI	177	US
131	9	Okten and Weisbrod	2000	1982 -1994	NCCS SOI	5914	US
132	9	Okten and Weisbrod	2000	1982 -1994	NCCS SOI	327	US
133	9	Okten and Weisbrod	2000	1982 -1994	NCCS SOI	681	US
134	9	Okten and Weisbrod	2000	1982 -1994	NCCS SOI	1387	US
135	9	Okten and Weisbrod	2000	1982 -1994	NCCS SOI	4714	US
136	9	Okten and Weisbrod	2000	1982 -1994	NCCS SOI	1054	US
137	9	Okten and Weisbrod	2000	1982 -1994	NCCS SOI	535	US
138	10	Khanna, Posnett, and Sandler	1995	1983 -1990	Chatiries Aid Foundation	1272	UK
139	10	Khanna, Posnett, and Sandler	1995	1983 -1990	Chatiries Aid Foundation	1272	UK
140	10	Khanna, Posnett, and Sandler	1995	1983 -1990	Chatiries Aid Foundation	1272	UK
141	10	Khanna, Posnett, and Sandler	1995	1983 -1990	Chatiries Aid Foundation	1272	UK
142	10	Khanna, Posnett, and Sandler	1995	1983 -1990	Chatiries Aid Foundation	1272	UK
143	10	Khanna, Posnett, and Sandler	1995	1983 -1990	Chatiries Aid Foundation	480	UK
144	10	Khanna, Posnett, and Sandler	1995	1983 -1990	Chatiries Aid Foundation	160	UK
145	10	Khanna, Posnett, and Sandler	1995	1983 -1990	Chatiries Aid Foundation	160	UK
146	10	Khanna, Posnett, and Sandler	1995	1983 -1990	Chatiries Aid Foundation	472	UK
147	11	Kingma	1995	1992	American Red Cross	511	us
148	11	Kingma	1995	1992	American Red Cross	511	usa
149	12	Khanna and Sandler	2000	1983 -1990	Chatiries Aid Foundation	1272	UK
150	12	Khanna and Sandler	2000	1983 -1990	Chatiries Aid Foundation	1272	UK
151	12	Khanna and Sandler	2000	1983 -1990	Chatiries Aid Foundation	1272	UK
152	12	Khanna and Sandler	2000	1983 -1990	Chatiries Aid Foundation	1272	UK

153	12	Khanna and Sandler	2000	1983 -1990	Chatiries Aid Foundation	480	UK
154	12	Khanna and Sandler	2000	1983 -1990	Chatiries Aid Foundation	160	UK
155	12	Khanna and Sandler	2000	1983 -1990	Chatiries Aid Foundation	160	UK
156	12	Khanna and Sandler	2000	1983 -1990	Chatiries Aid Foundation	472	UK
157	13	Smith	2007	1998 -2003	Unified database of arts organizations and NCCS digitized	2629	us
158	13	Smith	2007	1998 -2003	Unified database of arts organizations and NCCS digitized	2629	us
159	13	Smith	2007	1998 -2003	Unified database of arts organizations and NCCS digitized	2629	us
160	13	Smith	2007	1998 -2003	Unified database of arts organizations and NCCS digitized	2629	us
161	13	Smith	2007	1998 -2003	Unified database of arts organizations and NCCS digitized	2629	us
162	13	Smith	2007	1998 -2003	Unified database of arts organizations and NCCS digitized	5083	us
163	13	Smith	2007	1998 -2003	Unified database of arts organizations and NCCS digitized	5083	us
164	13	Smith	2007	1998 -2003	Unified database of arts organizations and NCCS digitized	5083	us
165	14	Suárez and Hwang	2013	2004	survey	183	us
166	14	Suárez and Hwang	2013	2004	survey	183	california us
167	14	Suárez and Hwang	2013	2004	survey	183	california us
168	15	Smith	2003	1992-1996	Unified database of arts organizations, National endowment for the ARTs and NCCS	196	us
169	15	Smith	2003	1992-1996	Unified database of arts organizations, National endowment for the ARTs and NCCS	196	us
170	15	Smith	2003	1998	Unified database of arts organizations, National endowment for the ARTs and NCCS	456	us
171	15	Smith	2003	1998	Unified database of arts organizations, National endowment for the ARTs and NCCS	456	us

172	15	Smith	2003	1998	Unified database of arts organizations, National endowment for the ARTs and NCCS	456	us
173	16	Jacobs & Marudas	2006	1999-2002	NonProfit Times	79	US
174	17	Marudas and Jacobs	2004	1985-1994	National Center for Charitable Statistics Statement of Income and others	1096	us
175	17	Marudas and Jacobs	2004	1985-1994	National Center for Charitable Statistics Statement of Income and others	264	us
176	17	Marudas and Jacobs	2004	1985-1994	National Center for Charitable Statistics Statement of Income and others	840	us
177	17	Marudas and Jacobs	2004	1985-1994	National Center for Charitable Statistics Statement of Income and others	1096	us
178	17	Marudas and Jacobs	2004	1985-1994	National Center for Charitable Statistics Statement of Income and others	264	us
179	17	Marudas and Jacobs	2004	1985-1994	National Center for Charitable Statistics Statement of Income and others	840	us
180	18	Brooks	2003	1995	CPB	91	us
181	18	Brooks	2003	1994-1995	CPB	154	us
182	18	Brooks	2003	1994-1995	CPB	154	us
183	19	Callen	1994	1986-1987	Revenue Canada	72	CANADA
184	19	Callen	1994	1986-1987	Revenue Canada	72	CANADA
185	19	Callen	1994	1986-1987	Revenue Canada	72	CANADA
186	19	Callen	1994	1986-1987	Revenue Canada	72	CANADA
187	19	Callen	1994	1986-1987	Revenue Canada	72	CANADA
188	20	Hughes, Luksetich, and Rooney	2014	2004-2007	League of American Orchestra's annual reports	341	us
189	20	Hughes, Luksetich, and Rooney	2014	2004-2007	League of American Orchestra's annual reports	119	us
190	20	Hughes, Luksetich, and Rooney	2014	2004-2007	League of American Orchestra's annual reports	222	us
191	20	Hughes, Luksetich, and Rooney	2014	2004-2007	League of American Orchestra's annual reports	341	us

192	20	Hughes, Luksetich, and Rooney	2014	2004-2007	League of American Orchestra's annual reports	341	us
193	20	Hughes, Luksetich, and Rooney	2014	2004-2007	League of American Orchestra's annual reports	341	us
194	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	24111	US
195	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	24111	US
196	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	24111	US
197	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	24111	US
198	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	24111	US
199	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	24111	US
200	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	24111	US
201	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	24111	US
202	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	24111	US
203	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	24111	US
204	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	2385	US
205	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	2385	US
206	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	2385	US
207	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	2385	US
208	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	2385	US
209	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	2385	US
210	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	7011	US
211	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	7011	US
212	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	7011	US
213	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	7011	US
214	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	7011	US
215	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	7011	US
216	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	1395	US
217	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	1395	US

218	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	1395	US
219	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	1395	US
220	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	1395	US
221	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	1395	US
222	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	1287	US
223	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	1287	US
224	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	1287	US
225	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	1287	US
226	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	1287	US
227	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	1287	US
228	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	1152	US
229	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	1152	US
230	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	1152	US
231	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	1152	US
232	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	1152	US
233	21	Segal and Weisbrod	1998	1985-1993	IRS SOI	1152	US
234	22	Enjolras	2002	1998	Survey of Norwegian Mass Sport Organizations	218	Norway
235	22	Enjolras	2002	1998	Survey of Norwegian Mass Sport Organizations	218	Norway
236	23	Breman	2006	1989 - 2003	Swedish Foundation for Fundraising Control	2224	Sweden
237	23	Breman	2006	1989 - 2003	Swedish Foundation for Fundraising Control	2224	Sweden
238	23	Breman	2006	1989 - 2003	Swedish Foundation for Fundraising Control	764	Sweden
239	23	Breman	2006	1989 - 2003	Swedish Foundation for Fundraising Control	569	Sweden
240	23	Breman	2006	1989 - 2003	Swedish Foundation for Fundraising Control	457	Sweden
241	23	Breman	2006	1989 - 2003	Swedish Foundation for Fundraising Control	434	Sweden
242	23	Breman	2007	1989 - 2003	Swedish Foundation for Fundraising Control	1987	Sweden
243	23	Breman	2008	1989 - 2003	Swedish Foundation for Fundraising Control	1987	Sweden



244	23	Breman	2009	1989 - 2003	Swedish Foundation for Fundraising Control	687	Sweden
245	23	Breman	2010	1989 - 2003	Swedish Foundation for Fundraising Control	507	Sweden
246	23	Breman	2011	1989 - 2003	Swedish Foundation for Fundraising Control	410	Sweden
247	23	Breman	2012	1989 - 2003	Swedish Foundation for Fundraising Control	294	Sweden
248	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	59719	us
249	24	Wilsker	2011	1999	Form 990s with the IRS	10269	us
250	24	Wilsker	2011	2000	Form 990s with the IRS	11498	us
251	24	Wilsker	2011	2001	Form 990s with the IRS	12322	us
252	24	Wilsker	2011	2002	Form 990s with the IRS	12634	us
253	24	Wilsker	2011	2003	Form 990s with the IRS	12996	us
254	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	82080	us
255	24	Wilsker	2011	1999	Form 990s with the IRS	13847	us
256	24	Wilsker	2011	2000	Form 990s with the IRS	15646	us
257	24	Wilsker	2011	2001	Form 990s with the IRS	16821	us
258	24	Wilsker	2011	2002	Form 990s with the IRS	17457	us
259	24	Wilsker	2011	2003	Form 990s with the IRS	18309	us
260	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	96591	us
261	24	Wilsker	2011	1999	Form 990s with the IRS	18087	us
262	24	Wilsker	2011	2000	Form 990s with the IRS	19207	us
263	24	Wilsker	2011	2001	Form 990s with the IRS	19790	us
264	24	Wilsker	2011	2002	Form 990s with the IRS	19673	us
265	24	Wilsker	2011	2003	Form 990s with the IRS	19834	us
266	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	240988	us
267	24	Wilsker	2011	1999	Form 990s with the IRS	42178	us
268	24	Wilsker	2011	2000	Form 990s with the IRS	46643	us
269	24	Wilsker	2011	2001	Form 990s with the IRS	49427	us
270	24	Wilsker	2011	2002	Form 990s with the IRS	50833	us
271	24	Wilsker	2011	2003	Form 990s with the IRS	51907	us
272	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	59127	us
273	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	81304	us
274	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	95876	us
275	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	239241	us
276	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	239231	us
277	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	59127	us
278	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	81304	us
279	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	95876	us
280	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	239231	us
281	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	41191	us

282	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	55691	us
283	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	67237	us
284	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	166769	us
285	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	41191	us
286	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	55691	us
287	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	67237	us
288	24	Wilsker	2011	1998 - 2003	Form 990s with the IRS	166769	us
289	25	Krawczyk, Wooddell, & Dias	2017	2009-2011	Cultural Data Profile	10850	us
290	25	Krawczyk, Wooddell, & Dias	2017	2009-2011	Cultural Data Profile	10850	us
291	25	Krawczyk, Wooddell, & Dias	2017	2009-2011	Cultural Data Profile	10845	us
292	25	Krawczyk, Wooddell, & Dias	2017	2009-2011	Cultural Data Profile	10845	us
293	25	Krawczyk, Wooddell, & Dias	2017	2009-2011	Cultural Data Profile	10850	us
294	25	Krawczyk, Wooddell, & Dias	2017	2009-2011	Cultural Data Profile	10850	us
295	25	Krawczyk, Wooddell, & Dias	2017	2009-2011	Cultural Data Profile	10848	us
296	25	Krawczyk, Wooddell, & Dias	2017	2009-2011	Cultural Data Profile	10848	us
297	25	Krawczyk, Wooddell, & Dias	2017	2009-2011	Cultural Data Profile	10850	us
298	25	Krawczyk, Wooddell, & Dias	2017	2009-2011	Cultural Data Profile	10850	us

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### Effect Size Calculation Information

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No.	Zr	SEZr	w	wZr	wZr2	w2	w*	w*Zr
1	0	0.010874	8457	0	0	71520849	16.25358	0
2	0	0.010874	8457	0	0	71520849	16.25358	0
3	-0.01788	0.010874	8457	-151.243	2.704777	71520849	16.25358	-0.29067
4	0.025297	0.010874	8457	213.9347	5.411854	71520849	16.25358	0.411163
5	-0.01788	0.010874	8457	-151.243	2.704777	71520849	16.25358	-0.29067
6	0.025297	0.010874	8457	213.9347	5.411854	71520849	16.25358	0.411163
7	-0.01788	0.010874	8457	-151.243	2.704777	71520849	16.25358	-0.29067
8	-0.0253	0.010874	8457	-213.935	5.411854	71520849	16.25358	-0.41116
9	0.025297	0.010874	8457	213.9347	5.411854	71520849	16.25358	0.411163
10	-0.01788	0.010874	8457	-151.243	2.704777	71520849	16.25358	-0.29067
11	-0.0253	0.010874	8457	-213.935	5.411854	71520849	16.25358	-0.41116
12	0.025297	0.010874	8457	213.9347	5.411854	71520849	16.25358	0.411163
13	-0.01788	0.010874	8457	-151.243	2.704777	71520849	16.25358	-0.29067
14	0.025297	0.010874	8457	213.9347	5.411854	71520849	16.25358	0.411163
15	-0.0253	0.010874	8457	-213.935	5.411854	71520849	16.25358	-0.41116
16	0.025297	0.010874	8457	213.9347	5.411854	71520849	16.25358	0.411163
17	-0.0253	0.010874	8457	-213.935	5.411854	71520849	16.25358	-0.41116
18	0.025297	0.010874	8457	213.9347	5.411854	71520849	16.25358	0.411163
19	-0.0253	0.010874	8457	-213.935	5.411854	71520849	16.25358	-0.41116
20	0.025297	0.010874	8457	213.9347	5.411854	71520849	16.25358	0.411163
21	-0.09039	0.029235	1170	-105.757	9.559359	1368900	16.06133	-1.45179
22	-0.08865	0.029235	1170	-103.715	9.193857	1368900	16.06133	-1.42376
23	-0.10869	0.029235	1170	-127.172	13.8228	1368900	16.06133	-1.74577
24	-0.19125	0.029235	1170	-223.758	42.79276	1368900	16.06133	-3.07166
25	-0.19583	0.029235	1170	-229.123	44.86945	1368900	16.06133	-3.14531
26	-0.10114	0.029235	1170	-118.339	11.96923	1368900	16.06133	-1.62451
27	-0.08397	0.028149	1262	-105.968	8.897966	1592644	16.07741	-1.34999
28	-0.09002	0.031129	1032	-92.9012	8.363008	1065024	16.0319	-1.4432
29	-0.12069	0.060523	273	-32.9496	3.976838	74529	15.36814	-1.85485
30	-0.10644	0.029827	1124	-119.638	12.73412	1263376	16.05231	-1.70859
31	-0.08952	0.033884	871	-77.9702	6.979731	758641	15.98599	-1.43103
32	-0.10908	0.054074	342	-37.3037	4.068904	116964	15.54469	-1.69554
33	-0.16077	0.029235	1170	-188.102	30.24124	1368900	16.06133	-2.58219
34	-0.12262	0.029235	1170	-143.46	17.59044	1368900	16.06133	-1.96937
35	-0.57667	0.072932	188	-108.415	62.51985	35344	14.9867	-8.64244
36	-0.34597	0.082479	147	-50.8569	17.59469	21609	14.66074	-5.0721
37	-0.4464	0.082479	147	-65.6202	29.29258	21609	14.66074	-6.54449
38	-0.12912	0.072932	188	-24.2751	3.134461	35344	14.9867	-1.93512
39	-0.00521	0.058222	295	-1.53799	0.008018	87025	15.43293	-0.08046

40	-0.40906	0.058222	295	-120.672	49.36163	87025	15.43293	-6.31295
41	-0.01854	0.058222	295	-5.46813	0.101358	87025	15.43293	-0.28607
42	-0.42556	0.058222	295	-125.539	53.42411	87025	15.43293	-6.56759
43	0.030118	0.058222	295	8.88488	0.267597	87025	15.43293	0.464813
44	0.003714	0.046575	461	1.712107	0.006359	212521	15.72924	0.058417
45	-0.36073	0.046575	461	-166.297	59.98839	212521	15.72924	-5.67402
46	0.011141	0.046575	461	5.136227	0.057225	212521	15.72924	0.175247
47	-0.34326	0.046575	461	-158.241	54.31694	212521	15.72924	-5.39914
48	0.041769	0.046575	461	19.25565	0.804295	212521	15.72924	0.656999
49	-0.2258	0.095783	109	-24.6122	5.557432	11881	14.16812	-3.19916
50	-0.20271	0.095783	109	-22.0954	4.478943	11881	14.16812	-2.87202
51	-0.24235	0.095783	109	-26.4164	6.402091	11881	14.16812	-3.43368
52	-0.20456	0.095783	109	-22.2971	4.561127	11881	14.16812	-2.89825
53	-0.1823	0.095783	109	-19.8708	3.622481	11881	14.16812	-2.58287
54	-0.26667	0.073721	184	-49.0669	13.08455	33856	14.96078	-3.98956
55	-0.47221	0.073721	184	-86.8861	41.02823	33856	14.96078	-7.06459
56	-0.3011	0.073721	184	-55.4027	16.68182	33856	14.96078	-4.50471
57	-0.52925	0.073721	184	-97.3818	51.53917	33856	14.96078	-7.91797
58	-0.28147	0.073721	184	-51.7896	14.57696	33856	14.96078	-4.21094
59	-0.06364	0.058722	290	-18.4543	1.174349	84100	15.41903	-0.9812
60	-0.5155	0.058722	290	-149.495	77.06503	84100	15.41903	-7.94853
61	0.026197	0.058521	292	7.649529	0.200395	85264	15.42464	0.40408
62	-0.38136	0.058521	292	-111.357	42.46715	85264	15.42464	-5.88234
63	0.072714	0.058521	292	21.23241	1.543887	85264	15.42464	1.121583
64	-0.42813	0.058521	292	-125.013	53.52114	85264	15.42464	-6.60369
65	-0.07012	0.046625	460	-32.2544	2.261617	211600	15.72807	-1.10282
66	-0.3611	0.046625	460	-166.108	59.98221	211600	15.72807	-5.67947
67	-0.00186	0.046676	459	-0.85418	0.00159	210681	15.7269	-0.02927
68	-0.31397	0.046676	459	-144.113	45.24753	210681	15.7269	-4.93781
69	0.011141	0.046575	461	5.136227	0.057225	212521	15.72924	0.175247
70	-0.3314	0.046575	461	-152.776	50.6303	212521	15.72924	-5.2127
71	-0.26365	0.096225	108	-28.474	7.50713	11664	14.15109	-3.73091
72	-0.31013	0.096225	108	-33.4935	10.38719	11664	14.15109	-4.38861
73	-0.11596	0.095783	109	-12.6401	1.465794	11881	14.16812	-1.64299
74	-0.20271	0.095783	109	-22.0954	4.478943	11881	14.16812	-2.87202
75	-0.11183	0.097129	106	-11.8542	1.325688	11236	14.11619	-1.57865
76	-0.23443	0.097129	106	-24.8496	5.825482	11236	14.11619	-3.30926
77	-0.14863	0.073721	184	-27.3482	4.064816	33856	14.96078	-2.22365
78	-0.53627	0.073721	184	-98.6741	52.91615	33856	14.96078	-8.02305
79	-0.05482	0.074744	179	-9.81367	0.538034	32041	14.92688	-0.81837

80	-0.50919	0.074744	179	-91.1443	46.40939	32041	14.92688	-7.60056
81	-0.3011	0.073721	184	-55.4027	16.68182	33856	14.96078	-4.50471
82	-0.47549	0.073721	184	-87.4898	41.60037	33856	14.96078	-7.11367
83	-0.00468	0.002848	123290	-577.594	2.705939	15200424100	16.28273	-0.07628
84	-0.03053	0.01856	2903	-88.6261	2.705678	8427409	16.19403	-0.49439
85	0	0.009352	11435	0	0	130759225	16.26172	0
86	-0.02396	0.01456	4717	-113.001	2.707076	22250089	16.22885	-0.38878
87	0	0.018973	2778	0	0	7717284	16.18997	0
88	0	0.038749	666	0	0	443556	15.89619	0
89	-0.03163	0.01922	2707	-85.6298	2.708703	7327849	16.1875	-0.51205
90	-0.03292	0.020004	2499	-82.2693	2.708378	6245001	16.17944	-0.53264
91	-0.03584	0.02178	2108	-75.5487	2.707595	4443664	16.16004	-0.57916
92	-0.01115	0.006779	21761	-242.642	2.70554	473541121	16.2727	-0.18145
93	-0.05241	0.031846	986	-51.6774	2.708472	972196	16.02029	-0.83964
94	-0.09689	0.058722	290	-28.0967	2.722145	84100	15.41903	-1.49387
95	-0.0652	0.03959	638	-41.6001	2.712485	407044	15.87955	-1.03541
96	-0.09789	0.059339	284	-27.8006	2.721379	80656	15.40173	-1.50766
97	0	0.002848	123290	0	0	15200424100	16.28273	0
98	0	0.01856	2903	0	0	8427409	16.19403	0
99	0	0.009352	11435	0	0	130759225	16.26172	0
100	0	0.01456	4717	0	0	22250089	16.22885	0
101	0	0.018973	2778	0	0	7717284	16.18997	0
102	0	0.038749	666	0	0	443556	15.89619	0
103	0	0.01922	2707	0	0	7327849	16.1875	0
104	0	0.020004	2499	0	0	6245001	16.17944	0
105	0	0.02178	2108	0	0	4443664	16.16004	0
106	0	0.006779	21761	0	0	473541121	16.2727	0
107	0	0.031846	986	0	0	972196	16.02029	0
108	0	0.058722	290	0	0	84100	15.41903	0
109	0	0.03959	638	0	0	407044	15.87955	0
110	-0.09789	0.059339	284	-27.8006	2.721379	80656	15.40173	-1.50766
111	0.147971	0.058124	296	43.79933	6.481018	87616	15.43566	2.284026
112	0.305547	0.058124	296	90.44199	27.63431	87616	15.43566	4.716325
113	0.255767	0.058124	296	75.707	19.36335	87616	15.43566	3.947931
114	0.40244	0.099015	102	41.04887	16.5197	10404	14.04286	5.651406
115	0.42981	0.174078	33	14.18374	6.096316	1089	10.90397	4.686639
116	0.162207	0.171499	34	5.515043	0.894579	1156	11.01098	1.78606
117	0.241112	0.092057	118	28.45117	6.859906	13924	14.30999	3.450305
118	0.023201	0.01411	5023	116.541	2.703925	25230529	16.23225	0.376612
119	0	0.01411	5023	0	0	25230529	16.23225	0

120	0.068609	0.02069	2336	160.2706	10.996	5456896	16.17214	1.109554
121	0.054639	0.02069	2336	127.6369	6.973959	5456896	16.17214	0.88363
122	0.054639	0.02069	2336	127.6369	6.973959	5456896	16.17214	0.88363
123	0.054922	0.02069	2336	128.2975	7.046342	5456896	16.17214	0.888204
124	0.045666	0.02069	2336	106.6748	4.871369	5456896	16.17214	0.73851
125	0.013246	0.02069	2336	30.94204	0.40985	5456896	16.17214	0.214212
126	0.013246	0.02069	2336	30.94204	0.40985	5456896	16.17214	0.214212
127	0.009692	0.02069	2336	22.64082	0.219438	5456896	16.17214	0.156743
128	-0.01126	0.066667	225	-2.53311	0.028519	50625	15.18577	-0.17097
129	0.113092	0.059028	287	32.45748	3.670691	82369	15.41046	1.742804
130	-0.04358	0.07581	174	-7.58321	0.330489	30276	14.89119	-0.64898
131	0.074441	0.013007	5911	440.0215	32.7557	34939921	16.24014	1.208934
132	-0.05196	0.055556	324	-16.8346	0.874706	104976	15.50554	-0.80565
133	0.112424	0.038405	678	76.22352	8.569358	459684	15.90291	1.787869
134	0.178417	0.02688	1384	246.9293	44.05642	1915456	16.09549	2.871711
135	0.006263	0.014569	4711	29.50421	0.18478	22193521	16.22878	0.101638
136	0.094115	0.030846	1051	98.91517	9.309429	1104601	16.0364	1.50927
137	0.100995	0.043355	532	53.72947	5.426421	283024	15.80119	1.595845
138	0.000561	0.028072	1269	0.71162	0.000399	1610361	16.07854	0.009016
139	-0.00729	0.028072	1269	-9.25098	0.067439	1610361	16.07854	-0.11721
140	0.004206	0.028072	1269	5.337133	0.022447	1610361	16.07854	0.067623
141	-0.00729	0.028072	1269	-9.25098	0.067439	1610361	16.07854	-0.11721
142	-0.00617	0.028072	1269	-7.82777	0.048285	1610361	16.07854	-0.09918
143	-0.06613	0.045787	477	-31.5464	2.086316	227529	15.74726	-1.04144
144	-0.02292	0.079809	157	-3.59915	0.082509	24649	14.75447	-0.33824
145	0.059258	0.079809	157	9.303509	0.551308	24649	14.75447	0.87432
146	0.063018	0.046176	469	29.55527	1.862504	219961	15.7384	0.991797
147	-0.07284	0.044368	508	-37.0021	2.69519	258064	15.77905	-1.14933
148	0	0.044368	508	0	0	258064	15.77905	0
149	-0.04821	0.028072	1269	-61.1756	2.949137	1610361	16.07854	-0.77511
150	-0.03728	0.028072	1269	-47.3118	1.763911	1610361	16.07854	-0.59945
151	-0.03672	0.028072	1269	-46.6006	1.711283	1610361	16.07854	-0.59044
152	-0.01234	0.028072	1269	-15.6552	0.193134	1610361	16.07854	-0.19836
153	-0.18517	0.045787	477	-88.3241	16.35459	227529	15.74726	-2.91585
154	0.000791	0.079809	157	0.124119	9.81E-05	24649	14.75447	0.011664
155	0.078187	0.079809	157	12.27531	0.959766	24649	14.75447	1.153603
156	0.064855	0.046176	469	30.41701	1.972696	219961	15.7384	1.020715
157	0.880267	0.019514	2626	2311.581	2034.808	6895876	16.18451	14.24669
158	0.82693	0.019514	2626	2171.518	1795.693	6895876	16.18451	13.38345
159	0.202737	0.019514	2626	532.3871	107.9345	6895876	16.18451	3.281198

160	0.632509	0.019514	2626	1660.969	1050.579	6895876	16.18451	10.23685
161	0.347022	0.019514	2626	911.2786	316.2333	6895876	16.18451	5.616374
162	0.868252	0.01403	5080	4410.72	3829.617	25806400	16.23284	14.0942
163	0.082952	0.01403	5080	421.3937	34.95524	25806400	16.23284	1.346539
164	0.094496	0.01403	5080	480.0407	45.36202	25806400	16.23284	1.533942
165	-0.12281	0.074536	180	-22.1053	2.714678	32400	14.93379	-1.83397
166	-0.12281	0.074536	180	-22.1053	2.714678	32400	14.93379	-1.83397
167	-0.09535	0.074536	180	-17.1633	1.636553	32400	14.93379	-1.42396
168	1.358736	0.071982	193	262.236	356.3095	37249	15.01772	20.40511
169	1.09188	0.071982	193	210.7328	230.0949	37249	15.01772	16.39755
170	0.722642	0.046984	453	327.3569	236.5619	205209	15.71977	11.35977
171	0.5457	0.046984	453	247.2023	134.8984	205209	15.71977	8.578285
172	0.534292	0.046984	453	242.0345	129.3172	205209	15.71977	8.398953
173	-0.27769	0.114708	76	-21.1044	5.860465	5776	13.4112	-3.72415
174	0.045294	0.030248	1093	49.50598	2.242307	1194649	16.04581	0.726773
175	-0.09831	0.061898	261	-25.6601	2.52277	68121	15.32847	-1.50701
176	0.051732	0.034565	837	43.29955	2.239965	700569	15.97408	0.826369
177	0.042276	0.030248	1093	46.20762	1.953471	1194649	16.04581	0.678352
178	-0.09831	0.061898	261	-25.6601	2.52277	68121	15.32847	-1.50701
179	0.051732	0.034565	837	43.29955	2.239965	700569	15.97408	0.826369
180	-0.01275	0.1066	88	-1.12183	0.014301	7744	13.74187	-0.17518
181	0.490213	0.081379	151	74.02209	36.28655	22801	14.69957	7.205915
182	0.515691	0.081379	151	77.86938	40.15656	22801	14.69957	7.580442
183	0.094494	0.120386	69	6.52007	0.616106	4761	13.17533	1.244987
184	-0.00295	0.120386	69	-0.20329	0.000599	4761	13.17533	-0.03882
185	-0.10528	0.120386	69	-7.26447	0.764819	4761	13.17533	-1.38713
186	0.129042	0.120386	69	8.903906	1.148979	4761	13.17533	1.700173
187	0.247087	0.120386	69	17.04899	4.212581	4761	13.17533	3.255451
188	-0.05413	0.054393	338	-18.2948	0.990235	114244	15.53634	-0.84093
189	-0.0423	0.092848	116	-4.9064	0.207524	13456	14.28013	-0.604
190	-0.06634	0.067574	219	-14.529	0.963895	47961	15.15775	-1.00561
191	-0.04737	0.054393	338	-16.0098	0.758322	114244	15.53634	-0.7359
192	-0.03609	0.054393	338	-12.1998	0.440343	114244	15.53634	-0.56077
193	0.027073	0.054393	338	9.150745	0.24774	114244	15.53634	0.420618
194	0.010594	0.00644	24108	255.3944	2.705587	581195664	16.27388	0.172402
195	-0.01059	0.00644	24108	-255.394	2.705587	581195664	16.27388	-0.1724
196	-0.01059	0.00644	24108	-255.394	2.705587	581195664	16.27388	-0.1724
197	-0.01059	0.00644	24108	-255.394	2.705587	581195664	16.27388	-0.1724
198	0.010594	0.00644	24108	255.3944	2.705587	581195664	16.27388	0.172402
199	0	0.00644	24108	0	0	581195664	16.27388	0

200	-0.01059	0.00644	24108	-255.394	2.705587	581195664	16.27388	-0.1724
201	0	0.00644	24108	0	0	581195664	16.27388	0
202	-0.01059	0.00644	24108	-255.394	2.705587	581195664	16.27388	-0.1724
203	0	0.00644	24108	0	0	581195664	16.27388	0
204	0.033677	0.020489	2382	80.21976	2.7016	5673924	16.1743	0.54471
205	0.033677	0.020489	2382	80.21976	2.7016	5673924	16.1743	0.54471
206	0.033677	0.020489	2382	80.21976	2.7016	5673924	16.1743	0.54471
207	0	0.020489	2382	0	0	5673924	16.1743	0
208	0.033677	0.020489	2382	80.21976	2.7016	5673924	16.1743	0.54471
209	0	0.020489	2382	0	0	5673924	16.1743	0
210	0.019645	0.011945	7008	137.6709	2.704519	49112064	16.24712	0.319172
211	0	0.011945	7008	0	0	49112064	16.24712	0
212	0.019645	0.011945	7008	137.6709	2.704519	49112064	16.24712	0.319172
213	0.019645	0.011945	7008	137.6709	2.704519	49112064	16.24712	0.319172
214	0.019645	0.011945	7008	137.6709	2.704519	49112064	16.24712	0.319172
215	0	0.011945	7008	0	0	49112064	16.24712	0
216	0.044056	0.026803	1392	61.32555	2.701741	1937664	16.09657	0.709146
217	-0.04406	0.026803	1392	-61.3256	2.701741	1937664	16.09657	-0.70915
218	0.044056	0.026803	1392	61.32555	2.701741	1937664	16.09657	0.709146
219	-0.04406	0.026803	1392	-61.3256	2.701741	1937664	16.09657	-0.70915
220	0	0.026803	1392	0	0	1937664	16.09657	0
221	-0.04406	0.026803	1392	-61.3256	2.701741	1937664	16.09657	-0.70915
222	0.045866	0.027907	1284	58.8916	2.701106	1648656	16.08092	0.737563
223	0.045866	0.027907	1284	58.8916	2.701106	1648656	16.08092	0.737563
224	0.045866	0.027907	1284	58.8916	2.701106	1648656	16.08092	0.737563
225	0.045866	0.027907	1284	58.8916	2.701106	1648656	16.08092	0.737563
226	0.045866	0.027907	1284	58.8916	2.701106	1648656	16.08092	0.737563
227	0	0.027907	1284	0	0	1648656	16.08092	0
228	0.048477	0.029501	1149	55.69979	2.700145	1320201	16.0573	0.778406
229	-0.04848	0.029501	1149	-55.6998	2.700145	1320201	16.0573	-0.77841
230	0.048477	0.029501	1149	55.69979	2.700145	1320201	16.0573	0.778406
231	-0.04848	0.029501	1149	-55.6998	2.700145	1320201	16.0573	-0.77841
232	-0.04848	0.029501	1149	-55.6998	2.700145	1320201	16.0573	-0.77841
233	0	0.029501	1149	0	0	1320201	16.0573	0
234	0.789036	0.068199	215	169.6427	133.8541	46225	15.13825	11.94462
235	0.647311	0.068199	215	139.1718	90.08745	46225	15.13825	9.799156
236	-0.01493	0.021219	2221	-33.1647	0.495228	4932841	16.16634	-0.2414
237	-0.02661	0.021219	2221	-59.0935	1.572284	4932841	16.16634	-0.43013
238	0.063471	0.03625	761	48.30154	3.065754	579121	15.94369	1.011965
239	-0.04095	0.042033	566	-23.176	0.948988	320356	15.82944	-0.64817



240	0.157828	0.046932	454	71.65374	11.30894	206116	15.72097	2.481203
241	-0.43638	0.048168	431	-188.082	82.076	185761	15.69197	-6.84774
242	-0.01078	0.022451	1984	-21.3868	0.230541	3936256	16.1523	-0.17412
243	-0.0273	0.022451	1984	-54.1593	1.47844	3936256	16.1523	-0.44093
244	0.064301	0.038236	684	43.98204	2.828099	467856	15.90618	1.022787
245	-0.04946	0.044544	504	-24.9285	1.232995	254016	15.77516	-0.78026
246	0.140039	0.049568	407	56.99574	7.981607	165649	15.65836	2.192775
247	0.014531	0.058621	291	4.228621	0.061448	84681	15.42184	0.2241
248	-0.29221	0.004092	59716	-17449.4	5098.85	3566000656	16.28044	-4.75726
249	-0.47852	0.00987	10266	-4912.52	2350.757	105390756	16.25909	-7.78035
250	-0.35978	0.009327	11495	-4135.69	1487.948	132135025	16.26184	-5.85072
251	-0.32316	0.00901	12319	-3981.02	1286.512	151757761	16.26338	-5.25569
252	-0.17591	0.008898	12631	-2221.96	390.8732	159542161	16.26391	-2.86104
253	-0.34074	0.008773	12993	-4427.19	1508.507	168818049	16.26449	-5.54191
254	-0.40265	0.003491	82077	-33048.3	13306.88	6736633929	16.28165	-6.5558
255	-0.38317	0.008499	13844	-5304.57	2032.539	191656336	16.26574	-6.2325
256	-0.34111	0.007995	15643	-5336.02	1820.185	244703449	16.26794	-5.5492
257	-0.22715	0.007711	16818	-3820.19	867.7538	282845124	16.26912	-3.69552
258	-0.50548	0.007569	17454	-8822.59	4459.612	304642116	16.2697	-8.22395
259	-0.76928	0.007391	18306	-14082.4	10833.33	335109636	16.2704	-12.5165
260	-0.12197	0.003218	96588	-11780.5	1436.816	9329241744	16.28213	-1.98587
261	-0.19944	0.007436	18084	-3606.62	719.2917	327031056	16.27023	-3.24488
262	-0.12594	0.007216	19204	-2418.54	304.5884	368793616	16.27108	-2.04917
263	-0.08662	0.007109	19787	-1713.85	148.4458	391525369	16.27149	-1.40936
264	-0.09255	0.00713	19670	-1820.51	168.4926	386908900	16.27141	-1.50596
265	-0.20101	0.007101	19831	-3986.24	801.2769	393268561	16.27152	-3.27075
266	-0.35891	0.002037	240985	-86492.9	31043.49	58073770225	16.28378	-5.84447
267	-0.44601	0.004869	42175	-18810.7	8389.844	1778730625	16.27859	-7.2605
268	-0.44089	0.00463	46640	-20563	9065.965	2175289600	16.27919	-7.17729
269	-0.28404	0.004498	49424	-14038.2	3987.362	2442731776	16.27951	-4.62397
270	-0.90276	0.004435	50830	-45887.4	41425.33	2583688900	16.27966	-14.6966
271	-0.84311	0.004389	51904	-43760.8	36895.26	2694025216	16.27977	-13.7257
272	0.032437	0.004113	59124	1917.832	62.20959	3495647376	16.28039	0.528095
273	-0.0114	0.003507	81301	-926.646	10.56165	6609852601	16.28162	-0.18557
274	-0.00969	0.00323	95873	-928.872	8.999437	9191632129	16.28211	-0.15775
275	-0.06946	0.002044	239238	-16616.6	1154.128	57234820644	16.28377	-1.13101
276	-0.54063	0.002045	239228	-129334	69921.9	57230035984	16.28377	-8.8035
277	0.006098	0.004113	59124	360.5277	2.198434	3495647376	16.28039	0.099275
278	-0.03068	0.003507	81301	-2494.48	76.53566	6609852601	16.28162	-0.49955
279	-0.0113	0.00323	95873	-1083.68	12.2491	9191632129	16.28211	-0.18404

280	-0.54507	0.002045	239228	-130396	71075.3	57230035984	16.28377	-8.87582
281	0.000956	0.004927	41188	39.36747	0.037627	1696451344	16.27844	0.015559
282	0.026	0.004238	55688	1447.876	37.64445	3101153344	16.28012	0.423279
283	-0.00461	0.003857	67234	-309.706	1.426624	4520410756	16.28093	-0.075
284	-0.03053	0.002449	166766	-5091.03	155.4186	27810898756	16.28329	-0.4971
285	0.027279	0.004927	41188	1123.562	30.64951	1696451344	16.27844	0.444058
286	0.005367	0.004238	55688	298.9024	1.604343	3101153344	16.28012	0.087383
287	-0.00396	0.003857	67234	-266.491	1.056274	4520410756	16.28093	-0.06453
288	-0.02945	0.002449	166766	-4911.7	144.6623	27810898756	16.28329	-0.47959
289	0.067152	0.009602	10847	728.3942	48.91289	117657409	16.26047	1.091917
290	0.041589	0.009602	10847	451.1196	18.76177	117657409	16.26047	0.676262
291	0.107024	0.009604	10842	1160.351	124.1851	117548964	16.26045	1.740254
292	0.084402	0.009604	10842	915.0857	77.235	117548964	16.26045	1.372414
293	0.077791	0.009602	10847	843.7955	65.63942	117657409	16.26047	1.264913
294	0.094491	0.009602	10847	1024.943	96.84782	117657409	16.26047	1.536466
295	0.007855	0.009603	10845	85.19225	0.669223	117614025	16.26046	0.127733
296	0.09228	0.009603	10845	1000.781	92.35256	117614025	16.26046	1.500523
297	0.008534	0.009602	10847	92.56291	0.789886	117657409	16.26047	0.138759
298	0.001371	0.009602	10847	14.87636	0.020403	117657409	16.26047	0.022301

<b>Study Characteristics Information</b>							
<b>No</b>	<b>Orgs Type</b>	<b>Donations</b>	<b>Commercial Revenues</b>	<b>Data Structure</b>	<b>Model Specifications</b>	<b>Publication Bias</b>	<b>Environmental Variables</b>
1	Arts and Culture Organizations	Donated Income	Total Earned Revenue	Panel Data	Fixed Effect	Dissertation	None
2	Arts and Culture Organizations	Donated Income	Total Earned Revenue	Panel Data	Fixed Effect	Dissertation	None
3	Arts and Culture Organizations	Donated Income	Embedded Revenue	Panel Data	Fixed Effect	Dissertation	None
4	Arts and Culture Organizations	Donated Income	Nonembedded Revenue	Panel Data	Fixed Effect	Dissertation	None
5	Arts and Culture Organizations	Donated Income	Embedded Revenue	Panel Data	Fixed Effect	Dissertation	None
6	Arts and Culture Organizations	Donated Income	Nonembedded Revenue	Panel Data	Fixed Effect	Dissertation	None
7	Arts and Culture Organizations	Donated Income	Embedded Revenue	Panel Data	Fixed Effect	Dissertation	None
8	Arts and Culture Organizations	Donated Income	Integrated Revenue - Total	Panel Data	Fixed Effect	Dissertation	None
9	Arts and Culture Organizations	Donated Income	External Revenue	Panel Data	Fixed Effect	Dissertation	None
10	Arts and Culture Organizations	Donated Income	Embedded Revenue	Panel Data	Fixed Effect	Dissertation	None
11	Arts and Culture Organizations	Donated Income	Integrated Revenue - Total	Panel Data	Fixed Effect	Dissertation	None
12	Arts and Culture Organizations	Donated Income	External Revenue	Panel Data	Fixed Effect	Dissertation	None
13	Arts and Culture Organizations	Donated Income	Embedded Revenue	Panel Data	Fixed Effect	Dissertation	None
14	Arts and Culture Organizations	Donated Income	Integrated Revenue - Market	Panel Data	Fixed Effect	Dissertation	None

15	Arts and Culture Organizations	Donated Income	Integrated Revenue - Tech	Panel Data	Fixed Effect	Dissertation	None
16	Arts and Culture Organizations	Donated Income	External Revenue	Panel Data	Fixed Effect	Dissertation	None
17	Arts and Culture Organizations	Donated Income	Embedded Revenue	Panel Data	Fixed Effect	Dissertation	None
18	Arts and Culture Organizations	Donated Income	Integrated Revenue - Market	Panel Data	Fixed Effect	Dissertation	None
19	Arts and Culture Organizations	Donated Income	Integrated Revenue - Tech	Panel Data	Fixed Effect	Dissertation	None
20	Arts and Culture Organizations	Donated Income	External Revenue	Panel Data	Fixed Effect	Dissertation	None
21	international development organization	Donations	Commercial Revenues	Panel	Time-Series DOLS Estimator	Journal Paper	None
22	international development organization	Donations	Commercial Revenues	Panel	Time-Series DOLS Estimator	Journal Paper	None
23	international development organization	Donations	Commercial Revenues	Panel	Time-Series DOLS Estimator	Journal Paper	None
24	international development organization	Donations	Commercial Revenues	Panel	Time-Series DOLS Estimator	Journal Paper	None
25	international development organization	Donations	Commercial Revenues	Panel	Time-Series DOLS Estimator	Journal Paper	None
26	international development organization	Donations	Commercial Revenues	Panel	Time-Series DOLS Estimator	Journal Paper	None
27	international development organization	Donations	Commercial Revenues	Panel	Time-Series DOLS Estimator	Journal Paper	None
28	international development organization	Donations	Commercial Revenues	Panel	Time-Series DOLS Estimator	Journal Paper	None
29	international development organization	Donations	Commercial Revenues	Panel	Time-Series DOLS Estimator	Journal Paper	None
30	international development organization	Donations	Commercial Revenues	Panel	Time-Series DOLS Estimator	Journal Paper	None
31	international development organization	Donations	Commercial Revenues	Panel	Time-Series DOLS Estimator	Journal Paper	None
32	international development organization	Donations	Commercial Revenues	Panel	Time-Series DOLS Estimator	Journal Paper	None
33	international development organization	Donations	Commercial Revenues	Panel	Time-Series FMOLS Estimator	Journal Paper	None
34	international development organization	Donations	Commercial Revenues	Panel	Time-Series Johansen-Based Estimator	Journal Paper	None
35	United Way	Government Funding	Commercial Income	Cross-Sectional	OLS	Journal Paper	None
36	United Way	Government Funding	Commercial Income	Cross-Sectional	OLS	Journal Paper	None
37	United Way	Government Funding	Commercial Income	Cross-Sectional	OLS	Journal Paper	None

38	United Way	Revenues From United Ways	Commercial Income	Cross-Sectional	OLS	Journal Paper	None
39	education	Donations	Taxable Revenue	Panel	OLS	Journal Paper	None
40	education	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
41	education	Donations	Taxable Revenue	Panel	OLS	Journal Paper	None
42	education	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
43	education	Donations	Taxable Revenue	Panel	OLS	Journal Paper	State Individua Income Tax Rate And Gross State Product
44	medical	Donations	Taxable Revenue	Panel	OLS	Journal Paper	None
45	medical	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
46	medical	Donations	Taxable Revenue	Panel	OLS	Journal Paper	None
47	medical	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
48	medical	Donations	Taxable Revenue	Panel	OLS	Journal Paper	State Individua Income Tax Rate And Gross State Product
49	Arts and Culture Organizations	Donations	Taxable Revenue	Panel	OLS	Journal Paper	None
50	Arts and Culture Organizations	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
51	Arts and Culture Organizations	Donations	Taxable Revenue	Panel	OLS	Journal Paper	None
52	Arts and Culture Organizations	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
53	Arts and Culture Organizations	Donations	Taxable Revenue	Panel	OLS	Journal Paper	State Individua Income Tax Rate And Gross State Product
54	human services and public benefit	Donations	Taxable Revenue	Panel	OLS	Journal Paper	None
55	human services and public benefit	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
56	human services and public benefit	Donations	Taxable Revenue	Panel	OLS	Journal Paper	None
57	human services and public benefit	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
58	human services and public benefit	Donations	Taxable Revenue	Panel	OLS	Journal Paper	State Individua Income Tax Rate And Gross State Product
59	education	Donations	Advertising Revenue	Panel	OLS	Journal Paper	None
60	education	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
61	education	Donations	Product Sales Revenue	Panel	OLS	Journal Paper	None
62	education	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
63	education	Donations	Rental Revenue	Panel	OLS	Journal Paper	None
64	education	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None

65	medical	Donations	Advertising Revenue	Panel	OLS	Journal Paper	None
66	medical	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
67	medical	Donations	Product Sales Revenue	Panel	OLS	Journal Paper	None
68	medical	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
69	medical	Donations	Rental Revenue	Panel	OLS	Journal Paper	None
70	medical	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
71	Arts and Culture Organizations	Donations	Advertising Revenue	Panel	OLS	Journal Paper	None
72	Arts and Culture Organizations	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
73	Arts and Culture Organizations	Donations	Product Sales Revenue	Panel	OLS	Journal Paper	None
74	Arts and Culture Organizations	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
75	Arts and Culture Organizations	Donations	Rental Revenue	Panel	OLS	Journal Paper	None
76	Arts and Culture Organizations	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
77	human services and public benefit	Donations	Advertising Revenue	Panel	OLS	Journal Paper	None
78	human services and public benefit	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
79	human services and public benefit	Donations	Product Sales Revenue	Panel	OLS	Journal Paper	None
80	human services and public benefit	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
81	human services and public benefit	Donations	Rental Revenue	Panel	OLS	Journal Paper	None
82	human services and public benefit	Donations	Tax-Exempt Sales Revenue	Panel	OLS	Journal Paper	None
83	all	Donations	Program Revenue	Panel	OLS	Journal Paper	None
84	Environmental	Donations	Program Revenue	Panel	OLS	Journal Paper	None
85	Health	Donations	Program Revenue	Panel	OLS	Journal Paper	None
86	Mental health	Donations	Program Revenue	Panel	OLS	Journal Paper	None
87	Diseases	Donations	Program Revenue	Panel	OLS	Journal Paper	None
88	Medical research	Donations	Program Revenue	Panel	OLS	Journal Paper	None
89	Crime and legal	Donations	Program Revenue	Panel	OLS	Journal Paper	None
90	Employment	Donations	Program Revenue	Panel	OLS	Journal Paper	None
91	Public safety	Donations	Program Revenue	Panel	OLS	Journal Paper	None
92	Human services	Donations	Program Revenue	Panel	OLS	Journal Paper	None

93	Civil rights	Donations	Program Revenue	Panel	OLS	Journal Paper	None
94	Philanthropy	Donations	Program Revenue	Panel	OLS	Journal Paper	None
95	Science	Donations	Program Revenue	Panel	OLS	Journal Paper	None
96	Social science	Donations	Program Revenue	Panel	OLS	Journal Paper	None
97	all	Donations	Investment Income	Panel	OLS	Journal Paper	None
98	Environmental	Donations	Investment Income	Panel	OLS	Journal Paper	None
99	Health	Donations	Investment Income	Panel	OLS	Journal Paper	None
100	Mental health	Donations	Investment Income	Panel	OLS	Journal Paper	None
101	Diseases	Donations	Investment Income	Panel	OLS	Journal Paper	None
102	Medical research	Donations	Investment Income	Panel	OLS	Journal Paper	None
103	Crime and legal	Donations	Investment Income	Panel	OLS	Journal Paper	None
104	Employment	Donations	Investment Income	Panel	OLS	Journal Paper	None
105	Public safety	Donations	Investment Income	Panel	OLS	Journal Paper	None
106	Human services	Donations	Investment Income	Panel	OLS	Journal Paper	None
107	Civil rights	Donations	Investment Income	Panel	OLS	Journal Paper	None
108	Philanthropy	Donations	Investment Income	Panel	OLS	Journal Paper	None
109	Science	Donations	Investment Income	Panel	OLS	Journal Paper	None
110	Social science	Donations	Investment Income	Panel	OLS	Journal Paper	None
111	all	Current Voluntary Income	Autonomous Income	Cross-Sectional	OLS	Journal Paper	None
112	all	Current Voluntary Income	Autonomous Income	Cross-Sectional	OLS	Journal Paper	None
113	all	Legacies Received	Autonomous Income	Cross-Sectional	OLS	Journal Paper	None
114	Health	Current Voluntary Income	Autonomous Income	Cross-Sectional	OLS	Journal Paper	None
115	Overseas	Current Voluntary Income	Autonomous Income	Cross-Sectional	OLS	Journal Paper	None
116	Religion	Current Voluntary Income	Autonomous Income	Cross-Sectional	OLS	Journal Paper	None
117	Social welfare	Current Voluntary Income	Autonomous Income	Cross-Sectional	OLS	Journal Paper	None
118	sport clubs	Donations	Sport Supply	Panel	Missing	Journal Paper	None
119	sport clubs	Donations	Economic Activities	Panel	Missing	Journal Paper	None
120	ALL	Donations	Program Dues	Panel	OLS	Journal Paper	Per Capita Income, Population, Democratic Governor,
121	ALL	Donations	Program Dues	Panel	LIML	Journal Paper	Per Capita Income, Population, Democratic Governor,

122	ALL	Donations	Program Dues	Panel	2SLS	Journal Paper	Per Capita Income, Population, Democratic Governor,
123	ALL	Donations	Program Dues	Panel	GMM	Journal Paper	Per Capita Income, Population, Democratic Governor,
124	ALL	Donations	Program Dues	Panel	OLS	Journal Paper	Per Capita Income, Population, Democratic Governor,
125	ALL	Donations	Program Dues	Panel	LIML	Journal Paper	Per Capita Income, Population, Democratic Governor,
126	ALL	Donations	Program Dues	Panel	2SLS	Journal Paper	Per Capita Income, Population, Democratic Governor,
127	ALL	Donations	Program Dues	Panel	GMM	Journal Paper	Per Capita Income, Population, Democratic Governor,
128	Library	Donations	Program Service Revenue	Panel	OLS	Journal Paper	None
129	Art exhibit, Museum, Zoo	Donations	Program Service Revenue	Panel	OLS	Journal Paper	None
130	Supplying goods and services to the poor	Donations	Program Service Revenue	Panel	OLS	Journal Paper	None
131	Hospitals	Donations	Program Service Revenue	Panel	OLS	Journal Paper	None
132	Aid to handicap.	Donations	Program Service Revenue	Panel	OLS	Journal Paper	None
133	Scientific research	Donations	Program Service Revenue	Panel	OLS	Journal Paper	None
134	Higher education	Donations	Program Service Revenue	Panel	OLS	Journal Paper	None
135	Hospitals	Donations	Program Service Revenue	Panel	Two-Stage Least-Squares, Fixed effects	Journal Paper	None
136	Higher education	Donations	Program Service Revenue	Panel	Two-Stage Least-Squares, Fixed effects	Journal Paper	None
137	Scientific research	Donations	Program Service Revenue	Panel	Two-Stage Least-Squares, Fixed effects	Journal Paper	None
138	all	Donations	Autonomous Income	Panel	Pooled Model	Journal Paper	None
139	all	Donations	Autonomous Income	Panel	One-Way Fixed Effect	Journal Paper	None
140	all	Donations	Autonomous Income	Panel	One-Way Random Effect	Journal Paper	None
141	all	Donations	Autonomous Income	Panel	Two-Way Fixed Effect	Journal Paper	None
142	all	Donations	Autonomous Income	Panel	Two-Way Random Effect	Journal Paper	None
143	health	Donations	Autonomous Income	Panel	Fixed Effect Model	Journal Paper	None
144	overseas	Donations	Autonomous Income	Panel	Fixed Effect Model	Journal Paper	None
145	religion	Donations	Autonomous Income	Panel	Fixed Effect Model	Journal Paper	None
146	social welfare	Donations	Autonomous Income	Panel	Fixed Effect Model	Journal Paper	None
147	American red cross	Donations	Sales	Cross-Sectional		Journal Paper	
148	American red cross	Donations Per Capita	Sales	Cross-Sectional		Journal Paper	
149	all	Donations	Autonomous Income	Panel	Fixed Effects Models	Journal Paper	None



150	all	Donations	Autonomous Income	Panel	Fixed Effects Models	Journal Paper	None
151	all	Donations	Autonomous Income	Panel	Fixed Effects Models	Journal Paper	None
152	all	Donations	Autonomous Income	Panel	Fixed Effects Models	Journal Paper	None
153	health	Donations	Autonomous Income	Panel	Fixed Effects Models	Journal Paper	None
154	overseas	Donations	Autonomous Income	Panel	Fixed Effects Models	Journal Paper	None
155	religion	Donations	Autonomous Income	Panel	Fixed Effects Models	Journal Paper	None
156	social welfare	Donations	Autonomous Income	Panel	Fixed Effects Models	Journal Paper	None
157	Performing arts	Private Donations	Program Service Revenue	Panel	OLS	Journal Paper	State Dummy
158	Performing arts	Private Donations	Program Service Revenue	Panel	Tobit	Journal Paper	State Dummy
159	Performing arts	Private Donations	Program Service Revenue	Panel	I.V.	Journal Paper	None
160	Performing arts	Private Donations	Program Service Revenue	Panel	Fixed Effect	Journal Paper	None
161	Performing arts	Private Donations	Program Service Revenue	Panel	I.V. On F.E.	Journal Paper	None
162	Performing arts	Private Donations	Program Service Revenue	Panel	OLS	Journal Paper	State Dummy
163	Performing arts	Private Donations	Program Service Revenue	Panel	Tobit	Journal Paper	State Dummy
164	Performing arts	Private Donations	Program Service Revenue	Panel	I.V.	Journal Paper	None
165	all	Business Donations	Earned Income	Cross-Sectional	Logistic Regression	Journal Paper	None
166	all	Business Donations	Earned Income	Cross-Sectional	Logistic Regression	Journal Paper	None
167	all	Business Donations	Earned Income	Cross-Sectional	Logistic Regression	Journal Paper	None
168	dance organization	Non-Nea Contributions, Gifts, And Grants	Program Service Revenue	Panel	OLS	Journal Paper	State Dummy
169	dance organization	Non-Nea Contributions, Gifts, And Grants	Program Service Revenue	Panel	Fixed Effect Model	Journal Paper	State Dummy
170	dance organization	Private Donations	Program Service Revenue	Cross-Sectional	OLS	Journal Paper	State Dummy
171	dance organization	Private Donations	Program Service Revenue	Cross-Sectional	OLS	Journal Paper	State Dummy
172	dance organization	Private Donations And Non Nea Public Grants	Program Service Revenue	Cross-Sectional	OLS	Journal Paper	State Dummy
173	ALL	Net Donations	Program Service Revenue	Panel	OLS	Journal Paper	None
174	Hospitals	Private Donations	Program Revenue	Panel	Fixed Effect Model	Journal Paper	None
175	Scientific research	Private Donations	Program Revenue	Panel	Fixed Effect Model	Journal Paper	None
176	Higher education	Private Donations	Program Revenue	Panel	Fixed Effect Model	Journal Paper	None
177	Hospitals	Private Donations	Program Revenue	Panel	Fixed Effect Model	Journal Paper	None
178	Scientific research	Private Donations	Program Revenue	Panel	Fixed Effect Model	Journal Paper	None
179	Higher education	Private Donations	Program Revenue	Panel	Fixed Effect Model	Journal Paper	None

180	public radio	Donations Per Listener To Public Radio	Earned Revenue	Cross-Sectional	OLS	Journal Paper	Maximum State Tax Rate, Per Capita Personal Income, Coverage Area, National Public Radio Affiliate
181	public radio	Donations Per Listener To Public Radio	Earned Revenue	Panel	Fixed Effect Model	Journal Paper	Maximum State Tax Rate, Per Capita Personal Income, Coverage Area, National Public Radio Affiliate
182	public radio	Donations Per Listener To Public Radio	Earned Revenue	Panel	Fixed Effect Model	Journal Paper	Maximum State Tax Rate, Per Capita Personal Income, Coverage Area, National Public Radio Affiliate
183	all	Money Donations	Autonomous Income	Cross-Sectional	OLS	Journal Paper	None
184	all	Money Donations	Autonomous Income	Cross-Sectional	OLS	Journal Paper	None
185	all	Money Donations	Autonomous Income	Cross-Sectional	OLS	Journal Paper	None
186	all	Money Donations	Autonomous Income	Cross-Sectional	OLS	Journal Paper	None
187	all	Money Donations	Autonomous Income	Cross-Sectional	OLS	Journal Paper	None
188	arts	Private Support	Investment Income	Panel	Fixed Effect Model	Journal Paper	None
189	arts	Private Support	Investment Income	Panel	Fixed Effect Model	Journal Paper	None
190	arts	Private Support	Investment Income	Panel	Fixed Effect Model	Journal Paper	None
191	arts	Individual Support	Investment Income	Panel	Fixed Effect Model	Journal Paper	None
192	arts	Business Support	Investment Income	Panel	Fixed Effect Model	Journal Paper	None
193	arts	Foundation Support	Investment Income	Panel	Fixed Effect Model	Journal Paper	None
194	all	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
195	all	Donations	Program Service Revenues	Panel	Fixed Effect Model	Book Chapter	None
196	all	Donations	Program Service Revenues	Panel	Fixed Effect Model	Book Chapter	None
197	all	Donations	Program Service Revenues	Panel	Fixed Effect Model	Book Chapter	None
198	all	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
199	all	Donations	Program Service Revenues	Panel	Fixed Effect Model	Book Chapter	None
200	all	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
201	all	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
202	all	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
203	all	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
204	university or technology institute	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
205	university or technology institute	Donations	Program Service Revenues	Panel	Fixed Effect Model	Book Chapter	None

206	university or technology institute	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
207	university or technology institute	Donations	Program Service Revenues	Panel	Fixed Effect Model	Book Chapter	None
208	university or technology institute	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
209	university or technology institute	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
210	hospital general	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
211	hospital general	Donations	Program Service Revenues	Panel	Fixed Effect Model	Book Chapter	None
212	hospital general	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
213	hospital general	Donations	Program Service Revenues	Panel	Fixed Effect Model	Book Chapter	None
214	hospital general	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
215	hospital general	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
216	housing shelter	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
217	housing shelter	Donations	Program Service Revenues	Panel	Fixed Effect Model	Book Chapter	None
218	housing shelter	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
219	housing shelter	Donations	Program Service Revenues	Panel	Fixed Effect Model	Book Chapter	None
220	housing shelter	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
221	housing shelter	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
222	human services	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
223	human services	Donations	Program Service Revenues	Panel	Fixed Effect Model	Book Chapter	None
224	human services	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
225	human services	Donations	Program Service Revenues	Panel	Fixed Effect Model	Book Chapter	None
226	human services	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
227	human services	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
228	arts, culture, humanities	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
229	arts, culture, humanities	Donations	Program Service Revenues	Panel	Fixed Effect Model	Book Chapter	None
230	arts, culture, humanities	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
231	arts, culture, humanities	Donations	Program Service Revenues	Panel	Fixed Effect Model	Book Chapter	None
232	arts, culture, humanities	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
233	arts, culture, humanities	Donations	Program Service Revenues	Panel	OLS	Book Chapter	None
234	sports organizations	Public Grant	Commercialization	Cross-Sectional	Two-Stage Least Squares Regression	Journal Paper	Dummy For Large City
235	sports organizations	Public Grant	Commercialization	Cross-Sectional	Two-Stage Least Squares Regression	Journal Paper	Dummy For Large City
236	all	Private Donations	Membership Fees	Panel	Fixed Effect	Dissertation	None

237	all	Private Donations	Membership Fees	Panel	Fixed Effect	Dissertation	None
238	Health	Private Donations	Membership Fees	Panel	Fixed Effect	Dissertation	None
239	International aid	Private Donations	Membership Fees	Panel	Fixed Effect	Dissertation	None
240	Social Services	Private Donations	Membership Fees	Panel	Fixed Effect	Dissertation	None
241	Other	Private Donations	Membership Fees	Panel	Fixed Effect	Dissertation	None
242	all	Private Donations	Membership Fees	Panel	2SLS Fixed Effect	Dissertation	None
243	all	Private Donations	Membership Fees	Panel	2SLS Fixed Effect	Dissertation	None
244	Health	Private Donations	Membership Fees	Panel	2SLS Fixed Effect	Dissertation	None
245	International aid	Private Donations	Membership Fees	Panel	2SLS Fixed Effect	Dissertation	None
246	Social Services	Private Donations	Membership Fees	Panel	2SLS Fixed Effect	Dissertation	None
247	Other	Private Donations	Membership Fees	Panel	2SLS Fixed Effect	Dissertation	None
248	ARTS	Private Contributions	Program Service Revenue	Panel	OLS	Dissertation	None
249	ARTS	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
250	ARTS	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
251	ARTS	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
252	ARTS	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
253	ARTS	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
254	Education	Private Contributions	Program Service Revenue	Panel	OLS	Dissertation	None
255	Education	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
256	Education	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
257	Education	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
258	Education	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
259	Education	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
260	Health	Private Contributions	Program Service Revenue	Panel	OLS	Dissertation	None
261	Health	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
262	Health	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
263	Health	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
264	Health	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
265	Health	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
266	Human Services	Private Contributions	Program Service Revenue	Panel	OLS	Dissertation	None
267	Human Services	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
268	Human Services	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
269	Human Services	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
270	Human Services	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None

271	Human Services	Private Contributions	Program Service Revenue	Cross-Sectional	OLS	Dissertation	None
272	ARTS	Private Contributions	Program Service Revenue	Panel	Fixed Effect	Dissertation	None
273	Education	Private Contributions	Program Service Revenue	Panel	Fixed Effect	Dissertation	None
274	Health	Private Contributions	Program Service Revenue	Panel	Fixed Effect	Dissertation	None
275	Human Services	Private Contributions	Program Service Revenue	Panel	Fixed Effect	Dissertation	None
276	Human Services	Private Contributions	Program Service Revenue	Panel	Fixed Effect	Dissertation	None
277	ARTS	Private Contributions	Program Service Revenue	Panel	Fixed Effect	Dissertation	None
278	Education	Private Contributions	Program Service Revenue	Panel	Fixed Effect	Dissertation	None
279	Health	Private Contributions	Program Service Revenue	Panel	Fixed Effect	Dissertation	None
280	Human Services	Private Contributions	Program Service Revenue	Panel	Fixed Effect	Dissertation	None
281	ARTS	Private Contributions	Program Service Revenue	Panel	Instrument	Dissertation	None
282	Education	Private Contributions	Program Service Revenue	Panel	Instrument	Dissertation	None
283	Health	Private Contributions	Program Service Revenue	Panel	Instrument	Dissertation	None
284	Human Services	Private Contributions	Program Service Revenue	Panel	Instrument	Dissertation	None
285	ARTS	Private Contributions	Program Service Revenue	Panel	Instrument	Dissertation	None
286	Education	Private Contributions	Program Service Revenue	Panel	Instrument	Dissertation	None
287	Health	Private Contributions	Program Service Revenue	Panel	Instrument	Dissertation	None
288	Human Services	Private Contributions	Program Service Revenue	Panel	Instrument	Dissertation	None
289	arts	All Private Charitable Contributions	Program Service Revenue	Panel	Generalized Least Squares	Journal Paper	None
290	arts	All Private Charitable Contributions	Special Event Revenue	Panel	Generalized Least Squares	Journal Paper	None
291	arts	Individual Donations	Program Service Revenue	Panel	Generalized Least Squares	Journal Paper	None
292	arts	Individual Donations	Special Event Revenue	Panel	Generalized Least Squares	Journal Paper	None
293	arts	Trustee Donations	Program Service Revenue	Panel	Generalized Least Squares	Journal Paper	None
294	arts	Trustee Donations	Special Event Revenue	Panel	Generalized Least Squares	Journal Paper	None
295	arts	Corporate Donations	Program Service Revenue	Panel	Generalized Least Squares	Journal Paper	None
296	arts	Corporate Donations	Special Event Revenue	Panel	Generalized Least Squares	Journal Paper	None
297	arts	Foundation Donations	Program Service Revenue	Panel	Generalized Least Squares	Journal Paper	None
298	arts	Foundation Donations	Special Event Revenue	Panel	Generalized Least Squares	Journal Paper	None

The computation of random-effects means starts with the computation of weights ( $w^*$ )

$$w^* = 1/(SE^2 + \tau^2)$$

where SE = effect size standard errors

$$\tau^2 = \text{between-study variance}$$

Once the weights ( $w^*$ ) are available, we use the weights to estimate the weighted mean effect size ( $M_{ES}^*$ )

$$M_{ES}^* = \frac{\sum w_i^* ES}{\sum w_i^*}$$

Where ES = Fisher's Z effect sizes

To obtain Z statistics for calculating confidence interval, we compute a standard error ( $SE_{ES}^*$ ) for the weighted mean effect size ( $M_{ES}^*$ )

$$SE_{ES}^* = \frac{1}{\sum w_i^*}^{\frac{1}{2}}$$

Then,

$$Z = \frac{M_{ES}^*}{SE_{ES}^*}$$