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Public Authorities and Determinants of Aggregate Debt:
Kentucky's Municipal Governments

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2005

Executive Summary

Special purpose entities, or Public Authorities, constitute a substantial portion of the public sector. In Kentucky, these entities provide large percentages of the services offered by state and local governments, employ thousands, have immense budgets, and issue large quantities of debt. It is this debt issuance that may be of concern to public administrators.

The purpose of this study was to examine the numbers and types of Authorities operating in a selection of Kentucky municipalities and how these Authorities, combined with other possible determinants, affect the levels of aggregate debt in the jurisdictions.

A combination of analytical methods demonstrated that while some of the proposed determinants, such as tax revenue and population density, did appear to affect the levels of aggregate debt, the presence of autonomous Public Authorities was seemingly inconsequential. According to this study, autonomous Public Authorities do not affect the levels of aggregate debt in Kentucky's cities. Finally, the study demonstrates that the lack of transparency of information regarding these public entities operating in Kentucky's cities may be a cause for concern.

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Municipal governments throughout Kentucky, like states and cities across the country, have turned increasingly to the use of special purpose entities, or Public Authorities, to finance and administer public projects and services. There is considerable debate among scholars, administrators, and officers regarding the true purpose of special purpose entities. Some argue that they are often better suited for specific purposes than is the traditional model of government. Others argue that they are simply vehicles for debt. A case can be made for either point of view.

Though the nature and even the identities of special purpose entities in the public sector can be ambiguous, one thing is certain. They do, in general, issue debt and often do so in very large amounts. Even though the statutory obligation of debt is shifted from the government to the Authority in such cases, financial mismanagement of and, particularly, excessive debt issuance by Authorities can be costly and damaging to the creator government.

It is difficult to measure how much debt is too much, particularly when dealing with Authorities that, while legally separate, are inextricably linked to their parent governments. Currently, Kentucky's municipalities have Authorities operating within their boundaries and often have little control over the debt issuance of those entities. The Authorities are granted varying degrees of freedom in their own financial affairs and it is difficult to predict the long-term affects this may have on the individual governments. Moreover, there is very little transparency regarding the financial activities of Authorities, as they do not always have to report budgets or have debt issues approved by the creator governments. The public is generally not familiar with the activities of Authorities and, sometimes, the parent government has little knowledge of or control over the financial affairs of the entities. The result is that Authorities operate in a realm

largely obscured from our vision but have the capacity to severely affect the financial position of local governments.

To understand the effects that the financial activities of Public Authorities may have on their creators, it is useful to first look to the relationship between Authorities and the aggregate debt of a municipality. If Authorities are issuing large or excessive amounts of debt in Kentucky's communities, as some have argued they are prone to do, we would expect to see larger quantities of aggregate debt in municipalities with more loosely controlled Authorities. If this is the case, that Authorities or the lack of control over Authorities is associated with increased aggregate debt, there is cause for concern.

The purpose of this study is to identify and categorize the special purpose entities operating in a selection of Kentucky cities and determine if they or a combination of other factors are influencing the debt issuance in the jurisdiction. If there seems to be no association between Authorities and high debt, there is little cause for concern and municipalities should feel safe in the continued use of Authorities as service providers and financial vehicles. If, however, we find that there is some relationship between the use of Authorities, particularly with regard to their autonomy, and increased levels of aggregate debt, we must then more closely examine the safe use of special purpose entities.

The following study is a background of Public Authorities in the United States, an examination of the numbers and natures of Authorities in Kentucky cities, and an evaluation of Authorities in conjunction with other factors as determinants of aggregate debt.

Background

Since the creation of the Port Authority of New York in 1921, Public Authorities have emerged as increasingly large and important components of state and local governments. These entities, often identified as special districts, public corporations, special purpose entities, or public authorities, have grown at an impressive rate in the less than one century since they appeared in American government. The growth of Public Authorities has vastly outpaced the growth of their state and local parent governments in terms of number of entities, personnel, and budgets. (Eger, 2000) Along with this measurable expansion in size has come a quite accelerated rate of debt issuance. Public Authorities, by whatever names they may be identified, have for some time outpaced the debt financing of their parent governments in terms of number of issues, frequency of issues, and total debt outstanding. (Mitchell, 1996) Quite simply, the number and size of tax-exempt securities issued by Public Authorities is growing far faster than those of traditional state and local government entities.

As Public Authorities increase in size and number the general question is begged, is this a safe, practical, and acceptable alternative to the provision of public goods through traditional forms of government? A strong case can be made for the use of Public Authorities on the grounds that their focused mission and assumed expertise, along with their independent financial characteristics make them ideal for certain purposes. We may concede that in many instances the special nature of Authorities make them excellent purveyors of public goods and that, in addition, their independent financial structures make them easier to monitor and evaluate than traditional governmental organizations. Moreover, they certainly allow governments to undertake desirable projects that might not otherwise be feasible due to financial, statutory, or constitutional constraints.

However, the latter of these two advantages of Public Authorities might also be viewed as a potential drawback.

Across the United States, it is difficult to predict the effects of the financial activities of Public Authorities on their parent governments and constituents. There have been a few instances in which the license of special purpose entities to issue debt has resulted in over-extension and, sometimes, default or financial collapse. In such cases, the creator governments are inevitably left to pick up the pieces. There are a number of forces that could act to create such a situation, from internal mismanagement to outside influences.

It is important then, that governments create these special purpose entities with this in mind and make every attempt to ensure the stability and success of the entity. There are a number of steps governments can take to try to promote the financial responsibility of Public Authorities and they are usually established with the Authority's creation. (Leigland, 1994) Even though Authorities exist independently, their creators often impose restrictions and checks from their inceptions. Their activities can be subject to executive review or veto, legislative approval, or any other controls the creator governments wish to embed. There are no set guidelines for establishing these controls and governments have proved to be diverse and creative in their establishing of special purpose entities, with a variety of structures and widely ranging levels of autonomy.

In light of the variety of structures and degrees of autonomy found in Public Authorities, scholars have devoted considerable effort to characterizing and categorizing these entities as well as assessing their effectiveness in carrying out their stated objectives. Through these efforts, we have come to better understand the complex nature and existence of the many types of special purpose entities operating in the United States.

However, it remains difficult to predict whether the financial activities of Authorities will have any negative effects on their creator governments. The independent status of special purpose entities certainly shifts the statutory financial obligation off the creator government. It is not difficult, however, to understand the responsibility that still remains with the parent government even after the responsibility has been legally shifted to the Authority. In fact, one of the most common concerns expressed by interviewees in the course of this study was that, while there is sometimes no statutory obligation on the part of the creator government for the debt incurred by special purpose entities, implicit obligations remain and are quite real. Implicit obligations, refers to the understanding that, in the event of the failure of special purpose entity, the parent government will be responsible in the eyes of the public to restore stability and an acceptable level of service.

Herein is the potential problem with Public Authorities. They are created to be separate entities in many ways and, most importantly, are legally separate financial entities. However, they remain inextricably linked to their creator governments. This poses a potential problem when governments create Authorities that are autonomous to varying degrees. Governments often create special purpose entities with the authority to issue debt. While this debt is many times not the statutory obligation of the parent government, the government will bear the burden in numerous ways if the Authority should default or collapse. The government will be forced to endure public outrage while attempting to devise an alternative source of providing whatever good was the mission of the failed Authority. This is the implicit obligation of the creator government.

The prominent cities of Kentucky are certainly representative of this scenario. Each of the Commonwealth's major cities has within it entities that can accurately be

described as Public Authorities. Each city has created each of these entities with a different structure and degree of autonomy. Authorities across Kentucky are, as elsewhere, responsible for a range of public services and goods and comprise a substantial portion of the public sector. As Kentucky's major cities are in a similar position with regard to special purpose entities as the rest of the nation, similar potential problems loom. While the special purpose entities are legally separate, their financial activities could possibly have a negative impact on the municipal governments.

It is difficult to measure the potential for harm posed by special purpose entities and there are a number of ways one might approach this problem. One option is to examine the relationship between special purpose entities and the aggregate debt, or the sum of public entity-held debt in a jurisdiction. By first establishing the characteristics and levels of autonomy of special purpose entities in each city, then attempting to determine if this autonomy has any correlation with abnormal or accelerated debt issuance, we might determine how Public Authorities are and may continue to affect the financial positions of creator governments. Currently, it is difficult to tell if Kentucky's major cities have created Public Authorities whose operations may have adverse effects on their creator governments. By realizing the nature of these Authorities and their levels of financial autonomy, as well as any effects of these entities on increased aggregate debt, we might better understand whether Kentucky's Public Authorities are acting in manners that might negatively affect their parent governments.

Discussion of Terminology and Definitions

Aggregate Debt

Aggregate debt is the sum of all public debt in a given jurisdiction. This is an important but often overlooked figure that provides some insight into the overall position

of public entities in a city or region. When examining the financial positions of local governments, we typically focus only on the debt issued and held by the traditional government itself. The outstanding debt of a local government, as reported in Comprehensive Annual Financial Statements or other such documents, generally consists only of the debt for which that entity is directly obligated. This often includes GO debt, revenue bonds and other direct issues, as well as the issues of entities listed as component units. This figure is useful in understanding the financial position of the entity but it is usually only a small fraction of the aggregate public debt in a jurisdiction.

Defining and Characterizing Public Authorities

Public Authorities, used interchangeably with special purpose entities in this work as an umbrella term to describe a number of categories of public entities whose characteristics will be discussed hereinafter, possess a number of general traits that make them attractive alternatives to traditional governmental agencies. First, Authorities are often created with the assumption that their independent status, in that they are legally separate from their parent governments, will insulate them from the political concerns that sometimes interfere with optimal policy in traditional governmental entities. In other words, the creators of Public Authorities often hope that the legal separation of the entities from the government and its political affiliates will allow the Authorities to act solely in pursuit of their stated objectives.

Second, in addition to the insulation from political concerns, Public Authorities are often created to take advantage of the presumed benefits of governance by a single or narrowed purpose entity. The hope is that, in addition to minimizing the influence of politics, Authorities may minimize the influence of competing policy objectives. In traditional governmental organizations, the variety of objectives commonly place projects

and initiatives in competition for time, attention, and funding. This is not so prevalent an issue within single or narrow purpose Authorities. They are usually designed with a single or a narrow set of objectives in mind, and thus, they are not generally subject to the policy rivalry associated with traditional governments.

Another potential benefit derived from the creation of a special purpose Authority is the level of expertise that may arise from its specified objectives. The assumption is that, given its narrow interests, a Public Authority will develop a level of specialization and expertise within its ranks largely foreign to traditional state and local agencies or divisions.

Finally, and perhaps most importantly, Public Authorities are created as vehicles for funding. Notional and statutory limitations, both externally and internally imposed, limit the debt financing activities of state and local governments. Whether in the form of state imposed limitations on municipalities, self imposed ceilings, or a perceived lack of approval from constituents, there are myriad regulating forces affecting the debt financing of state and municipal governments. Whether the ceilings are definite, such as a dollar amount or percentage, or notional, vague, or otherwise non-specific, their effects are noticeable. When traditional governments wish to avoid the direct burden of additional debt financing or skirt internally or externally imposed restrictions, they commonly turn to the creation of Public Authorities. Using Authorities as financing vehicles may allow governments to fund necessary or desirable projects without incurring the direct, legal obligation of additional debt. The popularity of these independent entities has grown substantially since the creation of the Port Authority of New York and Public Authorities have emerged as a large and rapidly expanding facet of state and local government.

Several scholars have devoted their time to the study of special purpose public entities and most have found that one of the most glaring difficulties inherent in the endeavor is that of identification and classification. A section devoted to relevant and important research in the field will follow. First, however, it is necessary to briefly discuss the terminology and categorization used herein. As mentioned earlier, the term Public Authority will be used liberally in this analysis as an umbrella term to describe entities that are created by governments to serve public interests, but which maintain a legally separate status. Borrowing from the work of Robert Eger, discussed in more detail later, Public Authorities can be divided into the subcategories special districts, government corporations, and public authorities. Again, Eger's contribution to the study of these entities will be discussed later but, for now, it is sufficient to mention that the proper term Public Authority (capitalized) is divisible into the aforementioned subcategories. This is the basic categorization used in this analysis and is illustrated in Appendix A. Such entities are government creatures and are similar to the government in their purposes. However, they are separated by varying degrees from their creators.

Typically, the structures of Public Authorities make them distinct from the traditional models of government and often more similar to a corporate structure. They are usually governed by a board of some sort, a type of board of directors, consisting of some combination of members of the business community, government officials, ex-officio, and representatives from interested organizations. (Eger, 2000) While the makeup of governing boards can vary from one Authority to another, they are generally representative of the aforementioned categories of members. Boards are often appointed by policy makers but in many cases, are not legally subject to the creator government. Hence, board members may come to their positions through the government but their

official role is to serve only the mission of the Authority.

In a manner similar to private corporations, Public Authorities usually hire executive officers to serve at the pleasure of the board. These executives are often professionals with experience or expertise in a related business or experienced public sector executives. These executives are, in turn, responsible for the daily operations of the entity and its operational and personnel activities. In this respect, Authorities are quite similar to private firms. The executive officers are responsible to the board but do not generally have any direct political ties or obligations.

Another common aspect of entities that may be characterized as Public Authorities is that their financial activities are usually independent of those of their parent governments. Some Public Authorities, such as school districts, fall into the category of special districts and may have the authority to levy taxes separate from those imposed by the parent government. In such cases, however, the entity is often directly subject to the approval of the population through measures like elected boards and referendums. The focus of this analysis is, on the other hand, those Authorities that do not have direct subjugation to the voters and who finance their activities by vehicles other than taxation. The most popular vehicle for finance in such entities, and the primary subject of this study, is the issuance of debt in the form of bonds. As mentioned earlier, many Authorities are created largely for their abilities to fund projects without affecting the direct or explicit debt obligations of their parent governments. Hence, a very common characteristic of those entities that may be described as Public Authorities is the authority to issue public debt. These are by no means the only characteristics of Public Authorities, nor do all Authorities fit these characteristics, but these descriptions are important identifiers for understanding the basic umbrella term of Public Authorities.

Study Overview

There are myriad entities across the United States that seem to fit the description of a Public Authority. However, the task of identifying and categorizing these bodies is a daunting one. There is no universally accepted set of characteristics common to all Public Authorities and they can have as many different structures, purposes, and activities as they have different names. Moreover, there are no recognized information repositories for the existence or activities of these entities. As a result, Public Authorities maintain a sort of anonymity in the public realm and often operate outside the direct scrutiny of the public eye.

The identification problem in dealing with Public Authorities is, on one hand, one of the most compelling aspects of their study and, on the other, one of the field's most notable drawbacks. It is quite difficult to obtain the information necessary to identify Authorities and determine into which sub-categories of the umbrella term they may fall and, accordingly, equally difficult to collect the data required to analyze the financial impacts of their activities. In fact, I was surprised to learn how many of the government officials contacted for this study were not familiar with the term Authority and how many, following its basic explanation, had little knowledge of the existence or activities of such entities within their jurisdictions. A great many of those contacted for this analysis could provide only lists of entities, some qualifying as Authorities and some not, and little more. They often had little to no understanding of the financial activities of these bodies, their legal status with regard to the creator governments, or their levels of autonomy or subservience to those governments.

Despite the difficulties associated with studying Public Authorities, it is my hope that this analysis may help us better understand the nature of Public Authorities in

selected Kentucky cities and their impacts upon aggregate debt. The goal of this study was to first identify those public bodies that qualify under the umbrella term of Public Authorities. Second, it was necessary to place these Authorities into sub-categories for the purpose of examining their debt financing activities. Next, data related to financial activities were collected from the Public Authorities identified in the selected cities along with data from the cities themselves. The data were then analyzed to determine the effects of Authorities and other possible variables on aggregate debt.

This study contains a few distinct sections, the first of which is a history of Public Authorities in the United States. Following the history will be a discussion of the relevant literature that laid the groundwork for this analysis. Next is a section outlining the design, data collection methods, and tools of analysis used in the study as well as any threats to validity. The fourth section presents the results of the analysis, including the statistical results and other empirical findings as well as a discussion of these results and their interpretation. Finally, the last section includes some conclusions drawn from the analysis along with a discussion of the necessity for further examination.

History

Through the Roosevelt Era

The first recognized Public Authority arose with the 1857 creation of the Mersey Docks and Harbor Act, by which the British established the Mersey Docks and Harbor Board. This act is credited with creating the first special purpose entity or Public Authority, known as the Port of London Authority. (Eger, 2000)

In 1921, Public Authorities emerged in the United States with the Port of New

York Authority, since 1972 known as Port Authority of New York and New Jersey. (Mitchell, 1996) This special purpose entity was created in response to the economic competition between the two states for which it is now known. In the early twentieth century, the shipping industry in and around New York Harbor was chaotic and intense, as was the competition between New York and New Jersey to realize its benefits. The turmoil between the states came to a head over the issue of the transcontinental railroads, on which the local and national economies were heavily dependent. At the time, the railroads terminated in New Jersey and passengers and cargo bound for New York City had to board ferries for transportation over the Hudson River. During this period, the cities on either side of the river owned and operated the piers and the competition for the railroad freight resulted in an inefficient mess of delays and high costs. (Eger, 2000) To compound the tension, railroads paid a single price for shipping to New Jersey or New York, regardless of the high price of traversing the river. This led the State of New Jersey to file a complaint with the Interstate Commerce Commission claiming that the single price was discriminatory. New Jersey's complaint was heard and rejected.

In 1921, five years after the Interstate Commerce disagreed with New Jersey's complaint of price discrimination, the legislatures of both states approved the creation of a bi-state port authority to improve and manage the transportation systems in the area. (Eger, 2000) The authority was charged with the improvement of the area within a twenty-five mile perimeter of the Statue of Liberty. It was given the authority to levy fees and charges and was established legally separate and independent from its parent governments. That independence meant the Authority had autonomy in managing its own financial activities, purchasing and development, and personnel decisions. The creator governments did, however, retain authority to subject the financial and managerial

policies of the Authority, as reflected in its minutes, to the approval of the Governors of both states. As with many modern Public Authorities, this placed the Port Authority in a somewhat ambiguously autonomous position; separate and independent from the creator government(s) but still to some degree linked.

This was the first and, for a brief period, the only modern Public Authority in the United States. However, due largely to its effectiveness in dealing with the complex transportation problems in the Harbor, it was not the only such entity for long. The United States had its first glimpse of the potential advantages of an autonomous special purpose entity. The Port Authority's singular and focused purpose, its assumed expertise, and its freedom from the budgetary and political constraints of its creator governments enabled the new entity to untangle and improve a complex situation fraught with economic and political competition. While the Port Authority was not a perfect solution to the chaos of the Harbor, it substantially improved efficiency and served to relieve a great deal of the pressure between the two states as well as the other interested parties. (Eger, 2000) As a result of this success, the popularity of Public Authorities grew and other such special purpose entities began to appear shortly thereafter.

The growth of Public authorities continued throughout the 1930's with such notable entities as the New York State Power Authority, created to harness hydroelectric energy from the St. Lawrence River for the provision of power to the state. (Eger, 2000) Concurrently, the height of the Great Depression did a great deal to spur the growth of Public Authorities. At a time when many public agencies were ill-equipped to address the economic failings, unemployment, and foreclosures brought on by the depression, government corporations, a form of modern Public Authority, offered an attractive solution. President Franklin Delano Roosevelt's New Deal included the creation of

numerous Authorities, largely as public works projects to address the staggering unemployment. Some of the more notable of the New Deal Authorities were the Tennessee Valley Authority, the Federal Deposit Insurance Corporation, and the Public Works Administration. (Axlerod, 1992) These types of entities were largely favored over traditional models of government for their financial autonomy, making them more ideal for accurate financial analysis and performance evaluation, freedom from political constraints, and focused missions.

In addition to creating numerous Federal Authorities, Roosevelt's New Deal policies also strongly promoted the use of public corporations by state and local governments. (Eger, 2000) The Roosevelt Administration believed that the states could benefit from public corporations for the same reasons as the Federal Government. Moreover, Roosevelt urged states to use Authorities to circumvent budgetary and debt limitations. As a result of the previous successes of Public Authorities as well as the promotion on their behalf by the Roosevelt Administration, state and local governments created hundreds of these entities throughout the 1930's. (Eger, 2000) They were created in large part to provide utilities such as water, sewer, and electrical systems. However, they were also created to address other public issues such as housing and economic development.

It was during this time of great growth for Public Authorities that some of these entities began to exhibit their potential drawbacks. All Authorities were created with limitations, and many with sunsets, to their activities and their perpetuation. However, in the face of these limitations, a few particularly effective executives of public corporations went to great lengths to perpetuate and expand their organizations and, thus, their positions. The most notable example of this empire building is that of Robert Moses and

the Triborough Bridge and Tunnel Authority, whose sunset was to coincide with the retirement of the entity's outstanding revenue bonds. Moses, seeing the writing of his elimination on the wall, prolonged the existence of his organization by extending the activities of the Authority well beyond its original purpose and including caveats in the bond covenants protecting his own powers. In fact, Moses was so effective in this pursuit that his reign did not end until 1967, when his Authority was merged with the Metropolitan Transportation Authority. This is an early and important example of the potential problems that may arise with autonomous nature of Public Authorities and is one of the instances that led to this study. This occurrence demonstrates that the very autonomy that makes authorities effective purveyors of public goods may also be an inherent danger, as the entities grow to a position and scope beyond the intent of their parent governments. (Axlerod, 1992)

When the Second World War reached the United States in 1941, governments again turned to the then decades-old practice of using special purpose entities to address specific public needs. As private firms were slow to respond to the need for wartime production, the Roosevelt Administration again intervened to create special purpose entities. These entities were created to produce and distribute wartime materials and spur the transition from a peacetime to a wartime economy. They ran factories and logistics, often in conjunction with or managed entirely by representatives from the private sector. These Authorities were instrumental in the Pacific naval buildup as well as Lend Lease and the massing of supplies in the European theater. Again, Public Authorities proved to be quite adept at addressing specific public needs, particularly in light of time constraints when traditional government agencies are notoriously slow to act.

The Post-Roosevelt Era to 1960

In the wake of World War Two, all levels of government stood face to face with the neglect of domestic projects arising from their all-out concentration on the war effort. The nation's infrastructure was being utilized at full capacity and was in desperate need of expansion and improvement. Bridges, roads, and tunnels were often insufficient or in a state of disrepair. (Axlerod, 1992) In addition, water and sewer systems across the country were barely, if at all, meeting the needs of the rapidly growing and increasingly mobile population. The transition of the United States away from reliance on mass transportation to a nation of personal motorists exacerbated these concerns. Roadways were insufficient to handle the exponential growth of automobile traffic and, concurrently, automobiles were enabling people to move away from metropolitan areas and mass transit to new developments in need of infrastructure. (Axlerod, 1992)

At the same time, veterans were returning home to a vastly changed nation and were searching for educations and employment as well as homes. The pressures of a growing and mobile population and deteriorating infrastructure left officials in all levels of government facing difficult decisions regarding the funding of new and desperately needed projects. (Axlerod, 1992) The prospects of incurring further debt obligations were largely unattractive. Even more unattractive were prospects of increasing taxes. Facing these two options, always motivation for creative financing, prompted governments to again resort to Public Authorities. Across the nation, hundreds of new special purpose entities were created to provide for new projects without tax increases or increased debt obligation. (Axlerod, 1992) They were born to create and maintain roads and bridges, sewer and water systems, provide opportunities for home ownership, and promote a higher rate of employment. Interestingly, when the expansion of the interstate

highway system and roadway improvements, all provided by traditional governmental entities as well as Public Authorities, decimated private mass transit firms, the public takeovers of the failing firms sparked the creation of more special purpose entities. AMTRAK and CONRAIL are two examples of public corporations that were created to salvage failing mass transit systems. (Eger, 2000)

At the same time, the nationwide demand for higher education expanded and public universities were in need of development. They needed to expand campus facilities, particularly dormitories. Again, special purpose entities, such as dormitory authorities were used to fund and oversee the necessary expansions. (Eger, 2000) In addition, Public Authorities were used to provide tuition assistance for the leagues of incoming new students. (Axlerod, 1992)

In the two decades following the Second World War, governments at all levels were faced with backlogged domestic projects resulting from the total resource effort demanded by the war. These immediate needs, along with the reluctance of governments to increase taxes or incur additional debt obligations, led to the creation of myriad new special purpose entities and a continuing increase in the scope of government in American lives.

The 1960's to the Present

In the 1960's and 1970's, public distrust of the government grew exponentially. Increasingly during this period, the public viewed the government as too powerful and too wasteful. In the midst of social upheaval and cultural revolution, there was a palpable feeling that the government could not be completely trusted. Exacerbating the problem for the government, inflation was rampant by the 1970's and taxpayers were increasingly dissatisfied with the service of their elected, appointed, and hired officials. All of these

trends compounded to cause governments nationwide to begin to examine their funding strategies and enforce financial, statutory, and constitutional constraints. (Axlerod, 1992) With these constraints, Public Authorities continued to carry favor with some governments for their abilities to circumvent ceilings on debt issuance. However, much of the public was less than thrilled by use of these entities to incur more debt and many saw Authorities as another example of the governments growing and oppressive power. It is difficult to guess how many such entities were created to avoid statutory, constitutional and budgetary constraints and how many were created to capitalize on the other useful characteristics. Whatever the reasons for their creation, Authorities born during this these two decades were viewed largely with suspicion and distrust or "a ploy to beat the system" (Axlerod, 1992). At the same time, corruption became a centerpiece of public conversation as scandals involving everyone from local officials to the President of the United States dominated the news. With specific regard to Public Authorities, special purpose entities from no less than fifteen states came under investigation during the 1970's for allegations of bribery, extortion, and other various forms of corruption. This period was a difficult one for all levels of government and Public Authorities were not immune to the public's general dissatisfaction.

This sense of distrust continued into the 1980's, although it was tempered by slowed inflation and a recovering economy. (Eger, 2000) The constraints brought on during the 1960's and 1970's continued as well while governments were facing increasing demand for improved infrastructure. This climate provided for the continued growth of Public Authorities, as public sentiment against tax increases and growing budget deficits coincided with the demand for public projects. (Eger, 2000) Governments again turned to special purpose entities. Opponents of special purpose entities managed a few small

victories during this period, as restrictions were placed on the types of projects that qualified for funding by tax-exempt securities. (Eger, 2000) However, when the separate status of special purpose entities was formally challenged, courts at the state and federal levels repeatedly found them to be legally independent entities.

The nineteen eighties also witnessed the largest collapse of such an entity in United States history, in the form of the Washington Public Power Supply System (WPPSS) default, demonstrating the potential harm that may come if a Public Authority is improperly managed (Leigland and Lamb, 1986). WPPSS was created to build, operate, and manage electrical power generation and transmission facilities in the State of Washington. This Authority enjoyed all the benefits of administrative and financial independence from its creator government, the State, commonly afforded such entities. It issued debt in large quantities in the form of tax-exempt bonds and, in the summer of 1983, defaulted on \$2.5 billion of these obligations. (Leigland and Lamb, 1986)

This default severely damaged the municipal bond market and sparked numerous lawsuits by lenders in an effort to collect the defaulted obligations from the creator government. (Eger, 2000) As in other cases, the courts found that WPPSS was legally separate and that its obligations were its own. The lenders were unable to recover their losses from the state government. (Leigland and Lamb, 1986) While the State was not found to be obligated to the lenders in the face of the default, it was not absolved of responsibility. Washington was left with a power system in disarray, a public whose trust had been damaged, and the responsibility of restoring both to a suitable level. This is a very good example of what can happen when a Public Authority is granted autonomy, operates outside the reach of the public and elected officials, and does so with reckless negligence. Even though the government was not statutorily obligated for the defaulted

debt, it was left with the expensive and time-consuming task of undoing the damage done by the mismanagement of the independent Authority. While this represents the most extreme scenario, smaller defaults happen from time to time and, in the event an Authority should collapse altogether, the parent government is left to pick up the pieces.

Today, special purpose entities remain as powerful a force as ever and their proportion to the rest of the public sector continues to grow. Opponents still claim that they are created to circumvent funding constraints, that they operate outside the reach of the public and officials, that their use of tax-exempt securities to generate funds creates economic inefficiencies, and that these securities are large federal tax expenditures and a drain on the U.S. Government. Nevertheless, the usefulness of Public Authorities in the provision of public goods seems to drown out their opponents and the growth of special purpose entities continues. While their uses have been restricted and they are often viewed with skepticism, they provide for popular projects that might not otherwise be feasible or palatable and thus, right or wrong, continue to grow in size and number.

Review of Relevant Literature

This section is a discussion of the works that were instrumental in the development of this analysis. The following scholars have advanced theories on many aspects of special purpose entities, ranging from characterization and categorization to financial and performance evaluation. Each of these scholars has contributed to the study of special purpose entities and these contributions are outlined hereinafter in the context of this study.

James Leigland

In chapter 19 of *The Handbook of Municipal Bonds and Public Finance*, (Lamb, et. al., 1993) “Overview of Public Authorities and Special Districts,” Leigland provides a good and comprehensive understanding of the entities discussed in this study. He examines the general characteristics of special purpose entities as well as the purposes for their creation. The general characteristics he identifies largely correspond to those identified by other scholars and include corporate status, legal separation from the creator government, independence and flexibility derived from a “business-like” status, governing boards (usually appointed), and the ability to access private money markets. He divides special purpose entities into two general categories: public authorities and special districts. He identifies the common distinctions that special districts, unlike public authorities, generally have elected rather than appointed boards, are smaller, have the authority to levy taxes, and do not issue debt. However, Leigland wisely points out that these generalizations do not always apply. In many states there are entities that blur these distinctions by demonstrating characteristics that apply to both public authorities and special districts. Some entities best described as public authorities are authorized to levy taxes and some special districts issue general obligation or revenue bonds. Throughout his work, Leigland discusses the roles, scopes, purposes, and characteristics of these types of entities while demonstrating the difficulty in categorization. He illustrates a wide variety of uses and structures across the spectrum of special purpose entities.

While Leigland explains that fitting these entities into specific categories is problematic, he is able to offer some useful tools for understanding organizations generally described as special purpose entities. He enumerates a set of advantages and

disadvantages that helps us better understand the nature of special purpose entities as a whole. Finally, Leigland offers three conclusions that may be derived from the evidence he presented. First, authorities and districts have been useful purveyors of public goods by increasing access to the bond market, facilitating timely construction management, and by providing for administrative and financial arrangements for services across multiple jurisdictions. They also allow for the circumvention of state and local restrictions pertaining to financing activities. Second, he concludes that the primary weakness of the corporate form of government is the tendency of special purpose entities, by any name, to remain isolated from broader policy planning frameworks. Third, government officials at all levels need much more complete information on the activities of government corporations in order to arrive at better and cost-effective decisions regarding their use.

In “Public Authorities and the Determinants of Their Use by State and Local Governments,” Leigland examines the general concepts associated with special purpose governments and how they contribute to our understanding of these entities. (Leigland, 1994) He concludes that the public authority concept has drawn attention to the widespread use of these forms of government but it has not contributed much to our understanding of why the use of these entities is widespread. In the second part of his study, Leigland attempts to address this lack of understanding and explain the prevalence of public authorities. He explains that there are two general rationales for their use. Supporters claim that public authorities allow for better management in the provision of public goods and services and promote their businesslike structures. Critics, however, argue that authorities are simply borrowing machines used to circumvent financing regulations. Leigland constructs a model for the proliferation of public authorities, using independent variables to explain the dependent variables, special purpose debt

outstanding and total number of special purpose governments. His conclusion is that the ability to raise money, rather than businesslike management, accounts for most of the popularity of public authorities.

It is in the second part of this study, in which he examined determinants of the use of Authorities, that Leigland demonstrated some important variables associated with special purpose entities. His use of these determinants, including population, density, tax capacity, and intergovernmental revenues, to examine the use of Authorities served as guidance for the work you currently read. He demonstrated that these variables may indeed correlate with the use of Public Authorities and, perhaps by extension, the issuance of debt. This part of Leigland's study was the empirical precedent for this analysis.

Leigland's work is useful in understanding the general concepts of public authorities and their characteristics. He illustrates the scope and uses of authorities and points out advantages and disadvantages. Perhaps most significantly, he demonstrates that despite the apparent usefulness of the businesslike structure of authorities, the ability to raise money for projects beyond the financial scope of traditional governments is the driving force behind their proliferation. This may lead one to question whether or not the fund-raising capabilities of public authorities open the door for undesirable levels of debt issuance or other unsound financial management. Moreover, Leigland points out the need for better and more complete information regarding the activities of public authorities both for the sake of study and for better public administration. This is a theme that will be revisited in this study.

R A Cropf, G D Wendel

Cropf and Wendel's article *The Determinants of Municipal Debt Policy: a pooled*

time series analysis helped to provide some of the variables for this study. In their study, the authors analyzed the effects of certain social, political, and economic factors on municipal debt behavior in a pooled time-series regression model. They found that these factors increased the cities' reliance upon revenue debt but not on general obligation debt. They pointed out a prevalent political stance of circumvention, with the cities taking the issues out of the voters' hands by turning to revenue debt. While not specifically relevant to this study, as it does not deal with aggregate debt or Authorities, their work demonstrated that several determinants of municipal debt can be observed. Namely, they identified tax revenues and expenditures, population density, and intergovernmental aid as determinants of debt policy. By extension, we should be able to apply most of the same determinants to aggregate debt.

Guntram B. Wolff

In *Fiscal Crises in U.S. Cities: Structural and Non-structural Causes*, Wolff reinforces some of these determinants of municipal debt. The main purpose of Wolff's study was to identify two categories of causes leading to fiscal problems in a sample of 900 U.S. Cities. Wolff found that structural problems such as immigration and congestion were more important to the fiscal crises than were non-structural causes such as weak mayors and union power. While this is not particularly important to the work you currently read, Wolff's examined debt issuance, particularly excessive debt, as a contributor to fiscal crisis in the cities. In so doing, the author presented several possible variables to explain debt issuance. Among these were income, tax revenue, expenditures, population, population growth, population density, and intergovernmental aid. This serves to reinforce the use of these proposed determinants for the present study.

Jerry Mitchell

Mitchell's work reminds us of the inherent difficulties with trying to evaluate the effects of special purpose entities or trying to characterize them or their effects as "good" or "bad." As Mitchell readily points out, there are so many types of Authorities and opinions regarding what these entities should do, how they should behave, and what roles they should play, it is difficult to make general assertions about them as a group.

(Mitchell, 1996) He discusses the usefulness as well as the drawbacks in the course of addressing the general characteristics of Public Authorities. The discussion provides an ideal background for the research of special purpose entities, as he dwells on the nature and roles of Public Authorities, the reasons for their use, their origins and history, and, most importantly for this study, issues related to public debt. Mitchell discusses types of special purpose entity debt and some of the mechanics of its issuance, as well as influences on Authorities and issues of performance evaluation.

Perhaps his contribution of greatest relevance to this work is found in *Public Authorities and Government Debt: Practices and Issues (1996)*. In this article, Mitchell identifies often latent problems with Public Authorities, aside from the difficulty of characterization and evaluation in general. The three problems identified in his work are defaults, reliance on intergovernmental subsidies, and "out of control" debt financing. The defaults, suggests Mitchell, may be occurring with growing frequency as special purpose entities are issuing bonds backed by revenue streams that are increasingly uncertain or elastic. The second issue Mitchell suggests is that Authorities may be becoming increasingly reliant upon intergovernmental subsidies. Not only would this be financially difficult for Authorities, having to make ends meet with the help of subsidies, but it would denigrate the purpose for creating Authorities in the first place. An Authority

that relies heavily upon intergovernmental subsidies diminishes the very independence and autonomy that make it an attractive alternative to traditional governmental models.

Finally, Mitchell addresses concerns that the debt financing activities of some Authorities may be out of control. He presents some evidence to that effect as well as statistics showing special purpose entity debt rising far more rapidly than the debt of traditional government entities. Mitchell also suggests that Authorities may be diversifying their activities and overextending debt in an effort of self preservation, or to perpetuate the existence of the entity. All of these factors, he contends, may combine to suggest that Authorities are issuing irresponsible levels of debt. However, he cautions us about making general assertions about Authorities. It is difficult to tell, he notes, how many and which Authorities are issuing responsible levels of debt. A few instances of reckless mismanagement, he warns, may not be enough to indict the genre for being out of control. Mitchell, however, does advance some suggestions ranging from simply reforming of Authorities to eliminating certain Authorities altogether. Again, what we draw from this part of his work is that there is no universal definition or set of characteristics for Authorities and is, hence, no universal tool for evaluating them or correcting for those that have gone awry.

Robert J. Eger III

Bob Eger's 2000 dissertation on Public Authorities was instrumental in devising this study. He examines the broad concept of Public Authorities and their functions in state and local governments. It is from Eger's dissertation that this study borrows the nomenclature special purpose entity, used interchangeably with Public Authority as an umbrella term to describe the types of public, corporate entities examined herein. This categorization is demonstrated in Appendix A.

Eger's dissertation also provides the three subcategories in which these entities are grouped for study: government corporations, public authorities, and special districts. He analyzed how special purpose entities are employed by state governments to carry out a variety of functions, particularly, how they are utilized for financial management. Eger also contributes a set of characteristics for each of the three subcategories of special purpose entities, from which this study draws extensively. His differentiation is demonstrated in Appendix B. Ultimately, Eger concluded from his analysis that there is evidence of three distinct subcategories of special purpose entities as theorized. He found that the three types of entities are separated by financial and administrative characteristics and that these characteristics are instrumental in understanding the nature and functions of special purpose entities.

This typology was an important first step in this study. It provided a starting point for the analysis of special purpose entities and established characteristics and categories for their study. By first differentiating between the types of authorities and their distinctions, it was then possible to narrow the focus of the study to those entities that possessed the most autonomous traits. Eger provided the tools and understanding to distinguish between the groups of special purpose entities and effectively analyze their activities and the implications of their use.

Design and Validity

There are as many reasons for local governments to create Public Authorities as there are names for those entities. Whatever the variety of names, structures, or functions these special purpose entities assume, it seems apparent that generalization of Authorities for the purpose of study is problematic. As several scholars have demonstrated,

Authorities differ so often in form and function that it is quite difficult to make any blanket statements about their activities, behavior, or effects. (Mitchell, 1996) With that in mind, this study attempts to examine the relationships between the presence and types of Public Authorities and the levels of aggregate debt in a selection of Kentucky's prominent cities. It is important to note that, as much as I might like this study to represent a microcosm of Authorities on a national or general level, this can in the end be only a study of those Authorities specifically examined and the jurisdictions in which they operate. In other words, this analysis of Kentucky cities should not necessarily be used to make general assertions about authorities at large.

This is a study of some of the Commonwealth's most populous cities and the special purpose entities that operate within their boundaries. The object of the study is to examine the effects of certain factors, particularly the use of Public Authorities, on aggregate debt in Kentucky's cities. As mentioned earlier, the statistical variable of interest in this study, the dependent variable, is aggregate debt. Aggregate debt, as reported by the local governments to the Governors Office for Local Development, is the total of the outstanding, publicly held debt in the defined area. This includes all general obligation municipal debt, as well as outstanding direct obligation municipal revenue bonds and notes. This also includes the outstanding debt of all other public entities operating in the area; like public parking corporations, river port authorities, housing authorities, airports, and any other special districts. (GOLD, 2004)

The Independent variables in which this study is interested are those factors one might reasonably believe to have a correlation with debt issuance. These variables include statistics like population and assessed property value as well the activities of Public Authorities. A number of the variables are economic indicators or demographic

statistics and a few have been designed by the author to help examine the activities of Public Authorities. The table of statistics used in this analysis is displayed in its entirety in appendix D.

Data collection for this study was conducted in a number of ways, beginning with the independent research of literature and published studies. Some of the data for the analysis were available through repositories like the US Census Bureau, the Kentucky League of Cities, and the Governor's Office for Local Development, Commonwealth of Kentucky. However, while I was able to obtain a number of the base statistics through on-line and printed publications and information repositories, little of the data specifically pertaining to Public Authorities was readily available. As will be discussed later in this study, one of the most formidable problems associated with Public Authorities is that they operate largely beyond the view of the public. These large organizations exist in relative obscurity compared to their creator governments, yet they provide many of the services most directly impacting the citizens on a daily basis.

However large, the separate status of the entities in which this study is particularly interested means that the financial data are decentralized and sometimes difficult to locate. In fact, the mere existence and numbers of the Authorities in each municipality were more elusive than expected. Hence, the second phase of data collection consisted of telephone and face to face interviews. Chief Financial Officers and Directors of Finance of local governments were the primary targets of the initial interviews, although in larger cities, administrators within Finance Departments tended to have more specific information and were more available for interviews.

First, the interviewees were given an outline of the characteristics generally applicable to Public Authorities. Some were already acutely aware of the terminology

while others required some explanation of the types of entities in which this study was interested. Next, the government officials were asked to identify as many entities as possible within their jurisdictions that may fit the general description, as prescribed earlier in this study, of special purpose entities. From this list, the interviewees were then asked to discuss any characteristics known of the entities, including purpose, structure, financing activities, administrative activities, whether and when they must seek approval from the creator governments for their activities, and any specific data they may have available.

These were informal interviews and were conducted without a specific set of questions, as different interviewees had different areas of expertise and access to different types of information. The result of this round of informal interviews was a general perspective of the types and scopes of entities operating in each area. In some cases, these interviewees provided very detailed information regarding all the Public Authorities in the jurisdiction. In most cases, however, much more investigation was necessary. Finally, the interviewees were asked for a list of contacts within the local government and, ideally, within the Public Authorities themselves.

For each city, the list of contacts was then explored to verify the information given by local officials and to obtain more complete information directly from the Public Authorities. Most of the information provided from separate sources seemed consistent and the specific financial data and organizational characteristics provided a clearer picture of the structures and activities of the Public Authorities.

As shown in Appendix D, both quantitative and qualitative data were collected for this study. Quantitative statistics like population, property value, and aggregate debt were obtained from published sources, while the general autonomy of Authorities in each

city, the qualitative measure, was determined from the information provided by informal interviews.

The study borrows from Eger's typology to characterize each Authority in terms of administrative and financial autonomy. (Eger, 2000) Authorities were identified and placed into sub-categories according to the criteria in Appendix B. Next, information provided in the interviews was used to identify "autonomous Authorities" according to the criteria in Appendix C. Note again that Authorities best described as special districts were discarded from the study as separate types of entities that do not generally issue debt. If any Authorities in a city were shown to be autonomous according to the model, the city was then placed in the category of those cities having autonomous Authorities, demonstrated by an entry of 1 in the field "Aut" in Appendix D. The data in Appendix D were then subjected to statistical analyses to examine any correlations between the proposed determinants of aggregate debt, or independent variables, and the dependent variable aggregate debt per capita, as well as any differences of statistical significance between those municipalities with autonomous Public Authorities and those without autonomous Authorities.

Below are the enumerated steps used in this analysis:

1. A nonrandom sample was collected to represent municipalities in Kentucky with constituent populations exceeding 18,000 residents.
2. Statistical data were gathered from published sources for use as independent variables.
3. Governments were contacted in the sample cities for interviews to identify Public Authorities. Using criteria derived from literary research, particularly Eger, Mitchell, and Leigland, combined with the information provided by interviewees, entities were

identified as possible Public Authorities.

4. Those identified as possible Public Authorities were verified as such through further research and grouped into categories per Appendix A and Appendix B. Special districts were discarded, leaving public authorities and government corporations.
5. The remaining Authorities were then examined according to the criteria in Appendix C for characteristics of administrative and financial autonomy.
6. From these criteria, the presence of “autonomous Authorities” was determined for each city.
7. The data were entered into the table in Appendix D for use in statistical analyses to examine the relationships between the independent variables and the dependent variable aggregate debt, as well as any differences of statistical significance between municipalities with autonomous Authorities and those without autonomous Authorities.

Issues of validity

Internal Validity -

History is a significant threat to the internal validity of this model, as determinants other than those identified herein as independent variables may act to affect the levels of aggregate debt per capita in each of the cities. This threat is one that cannot be eliminated but, rather, must be mitigated. In order to completely eliminate this threat, this model would have to account for factors that cannot be identified, qualified, or quantified. Moreover, to completely eliminate the history threat, this model would have to account for all the possible determinants of aggregate debt, which could include

constituent preferences, political motives and other variables that are difficult to pinpoint. This threat to validity must be understood but it does not in itself detract significantly from the model. It is not necessary to account for all the determinants of aggregate debt in order to conceptualize the relationships between the variables in this study. More specifically, we need not identify every determinant of aggregate debt in order to understand the relationship between Public Authorities and aggregate debt. The hope here is to include as many relevant variables as possible and simply concede that the inability to include some variables such as constituent preferences is a threat to validity.

Selection is a second threat to the internal validity of this model, as it is nonrandom. The population being examined in this study is Kentucky municipal governments with constituent populations greater than 18, 000. While this is technically a threat to the internal validity of the design, I do not think it will significantly affect the analysis. I do not think there are any factors influencing my selection of this sample that will have a discernible affect on the analysis.

There are two main types of threats to the internal validity of this model. The history threat is one that cannot be avoided. One must simply be mindful of this threat and view this model and the ensuing analysis in the context of that understanding. The second threat is a selection threat. Again, it would have been possible to randomize the selection of the sample from the population of municipal governments with over 18, 000 residents. However, I am unaware of any traits or characteristics that influenced my selection of these governments for the sample. They were chosen arbitrarily, with no prior knowledge of any of the data to be collected. Moreover, all of the governments originally selected for the sample were included in the final analysis. For example, even if the collection of data was abnormally difficult for a given municipal government, that

government was not omitted from the study. Such serious selection threats were avoided, at a substantial cost of time, to ensure the internal validity of this study.

If there is one specific result of the selection threat that stands out, it is that the sample seems to represent the more widely known of Kentucky's cities. These are simply the first cities that came to mind when thinking of a short list of Kentucky's larger municipal governments. This, however, is still not a serious threat to the internal validity of the model. It is, rather, something that must be pointed out and understood in order to better grasp the purpose and results of this study.

External Validity-

The most substantial shortcomings of this model are threats to external validity. There are two types of external validity threats at work in this model, one related to the structure of the model and one related to the nature of the subjects.

Selection. The first threat that makes it difficult to generalize the results of this model is similar to the selection problem that threatens its internal validity. With a nonrandom sample, limited in size by time constraints, the selection threat is formidable. While selection posed only a minor threat to internal validity, the threat to external validity is sizable. It is possible that this analysis may be loosely generalizable within the population of municipal governments from which this sample was taken. However, selection threats seriously limit the extent to which this analysis may be generalized outside this population.

Setting. This threat to external validity arises from the nature of the subjects rather than the structure of the analysis. The ability to generalize this analysis outside the selected population is severely limited by differences in locations and settings of municipalities. As many scholars have explained, the uses and natures of Public

Authorities vary between cities, states, and regions, largely without any discernible patterns. In other words, our ability to generalize the results of this analysis outside the selected population would be hampered by the effects of multiple settings. Different states and regions have very different preferences with regard to Public Authorities and debt issuance.

History is another threat to external validity that arises more from the nature of the subjects rather than the structure of the analysis. Again, it is difficult to generalize the results of this analysis beyond the sample and population when one considers the myriad forces that may combine to affect levels of aggregate debt. Moreover, as those authors cited in this study have noted, Public Authorities are difficult to classify or characterize in general terms. As a result, with so many entities with such varying characteristics, it is problematic to assume any generalizations regarding Public Authorities beyond the samples and populations.

These threats have some effects on the context in which this study should be viewed. The threats to the internal validity are minimal and should not have much of an effect on the analysis. As mentioned, we must be mindful of the fact that other factors not accounted for by this model may influence levels of aggregate debt. Furthermore, the sample is small and nonrandom. Ideally, we would like to eliminate both of these threats but, given the nature of the subject and the time constraints at hand, it is best to simply keep them in mind throughout the analysis. They should be noticed but they are not likely to seriously affect the results of the model.

The threats to the external validity are testament to the difficulty inherent in generalizing such a model beyond the original population. The fact that the sample is small and nonrandom combined with the affects of setting and history threats on the

dependent variable make it unreasonable to assume generalization is possible. This could be addressed, and the model strengthened, by increasing the size of and randomizing the sample. However, time constraints on this study precluded such an effort. The effects of setting and history could perhaps be mitigated by the introduction of new and complex variables to account for differences in location and factors not currently explained by the model. The addition of certain variables and the replication of the analysis in different settings would likely strengthen the model. Again, however, these steps would have been beyond the constraints of this analysis.

Even though the threats to external validity are formidable, they do not severely damage this study. It would be ideal to develop models that could be generalized across locations to deal with the many factors influencing Public Authorities and aggregate debt. It would also be a monumental task. This model is not intended to describe the relationship between the independent variables and aggregate debt on a national or even a regional level. This study is one of Kentucky's municipal governments. It should lend insight into the nature of the relationships between the variables in Kentucky and could perhaps even tempt us to draw some loose conclusions about Authorities and debt en masse. However, the limitations placed on this study lead to threats to external validity that preclude us from generalizing the results outside the chosen population. The study however, may still tell us something about Kentucky's municipalities and the variables included herein. Moreover, it may give us a better of idea of what other steps are necessary to better understand Public Authorities and the factors influencing aggregate debt.

Analysis and Results

The following section is a discussion of the empirical analyses used to test the hypotheses that correlations exist between certain determinants of aggregate debt and the levels of aggregate debt per capita in Kentucky's municipalities, as well as the hypothesis that the presence of autonomous Authorities is associated with levels of aggregate debt per capita in these municipalities.

Independent Variables

The following variables are those hypothesized to have some correlation with the levels of aggregate debt in the sample municipalities.

Population Shift (PopShift)

There are some logical and intuitive conclusions that may be reached with a very basic analysis of the data. First, looking at the percent change in population from 2000 to 2003, it seems that there may be some sort of relationship between the variables. One particular aspect stands out at first glance. The one municipal government that experienced a decline in population over this period has the lowest aggregate debt per capita by a considerable margin. This seems to support the theory that growth in population has a positive correlation with aggregate debt. However, simply arranging the data in ascending order of population growth and examining the levels of aggregate debt suggests that other factors are certainly at play, as shown in Figure 1.

Figure 1

Paducah	-2.90%	\$834.95	1
Owensboro	0.45%	\$8,414.56	6
Jefferson County	0.78%	\$3,706.18	5
Fayette County	2.41%	\$1,926.64	3
Bowling Green	2.77%	\$1,852.51	2
Florence	4.83%	\$2,058.27	4

According to the data, there are several other factors at work in determining the level of aggregate debt in a municipality. An inference that would be worth further

exploration is the notion that perhaps, while population growth by itself may not be a strong determinant of aggregate debt, a loss of population over a period may limit the amount of debt a municipality is willing to issue. Perhaps while the growth is positive, population shift is not a powerful determinant of aggregate debt but, when the population begins to decrease, debt issuance is somewhat curtailed.

Population Density (Dens)

Density has been widely accepted by scholars as a significant determinant of debt issuance. Theoretically, the more people per square mile the greater the need for extensive and costly infrastructure projects. Moreover, urbanization often gives rise to large housing authorities or other such debt-issuing entities that address the needs of urban societies. If the data reflect this theory, we would see aggregate debt increasing with population density. We can see in figure 2 that the data do not exactly follow that theory but the overall trend does appear to be positive. In general, aggregate debt is higher with the top three municipalities in population density than with the lower three.

Figure 2.1

Fayette County	\$915.60	\$1,926.64	3
Paducah	\$1,350.20	\$834.95	1
Bowling Green	\$1,392.30	\$1,852.51	2
Jefferson County	\$1,801.20	\$3,706.18	5
Florence	\$2,379.00	\$2,058.27	4
Owensboro	\$3,102.90	\$8,414.56	6

Furthermore, before dismissing this theory we should consider that one of the municipalities, Fayette Co., is a merged city-county government and that Jefferson Co is a county government just prior to merger (used as the closest possible approximation to the merged Louisville Metro Government). This means that the population density of the municipality is decreased by the addition of some sparsely populated, outlying areas. It is

possible that Figure 2 is skewed slightly by comparing purely city governments and merged governments. To examine this notion, Fayette Co. was removed and the City of Louisville was substituted for Jefferson County to derive Figure 2.2.

Figure 2.2

Paducah	\$1,350.20	\$834.95	1
Bowling Green	\$1,392.30	\$1,852.51	2
Florence	\$2,379.00	\$2,058.27	4
Owensboro	\$3,102.90	\$8,414.56	5
Louisville	\$4,124.90	\$1948.48	3

This still does not provide a linear correlation between the variables but some relationship seems evident. It is quite possible that the difficulty in comparing merged and traditional governments in this respect is too difficult a task with such a small sample. We might find with a larger sample that there is a linear or curvilinear, positive correlation between density and aggregate debt. Even this small dataset seems to suggest some trend of the like.

Property Value per Capita (PropVal)

Intuitively, one might expect that the assessed property value per capita of a municipality might have an inverse correlation with aggregate debt, or that as value increases, revenue would increase and the need to issue debt would decrease. Figure 3 illustrates the relationship between these variables without controlling for other factors.

Figure 3

Bowling Green	\$14,539.89	\$1,852.51	2
Owensboro	\$37,836.58	\$8,414.56	6
Paducah	\$43,921.00	\$834.95	1
Jefferson County	\$51,631.05	\$3,706.18	5
Fayette County	\$62,762.20	\$1,926.64	3
Florence	\$72,987.29	\$2,058.27	4

The relationship between assessed property value per capita and aggregate debt shown appears to be random. While it is hard to draw conclusions from a small sample, there does not seem to any significant interaction between these variables and perhaps property value is not a useful determinant of aggregate debt. Since there does not appear to be any correlation at first glance and since property value is accounted for in tax revenue, another independent variable in this study, property value per capita does not appear to be a useful determinant of aggregate debt.

Tax Revenue per Capita (TaxRev)

Like property value per capita, one might expect tax revenue per capita to correlate negatively with aggregate debt. This notion assumes that a municipal government collecting greater revenues per capita could rely more on pay as you go (paygo) funding and slightly less on debt financing. Figure 4 displays the relationship between tax revenue and aggregate debt per capita without controlling for other variables.

Figure 4

Owensboro	\$396	\$8,414.56	6
Jefferson County	\$515	\$3,706.18	5
Florence	\$577	\$2,058.27	4
Bowling Green	\$623	\$1,852.51	2
Paducah	\$718	\$834.95	1
Fayette County	\$737	\$1,926.64	3

Here it looks as though there is a negative correlation between tax revenue and aggregate debt per capita, even with a small sample. Even though the data do not demonstrate a perfectly linear correlation, they do suggest that the hypothesis that revenue and aggregate debt are negatively correlated is plausible. Further analysis will examine this relationship.

Intergovernmental Revenue as a Percent of Total Revenue (InterRev)

Intergovernmental revenue as a percent of total revenue is another possible

indicator of the level of aggregate debt held in a municipality. The assumption here would be that those municipalities that rely heavily upon intergovernmental aid would be the same that incur large amounts of aggregate debt. This would not represent a causal relationship but might nevertheless correlate with debt issuance. The percentages of intergovernmental revenue are displayed in figure 5, along with the levels and ranks of aggregate debt per capita in the sample municipalities.

Figure 5

Florence	6.68%	\$2,058.27	4
Paducah	12.2%	\$834.95	1
Bowling Green	14.36%	\$1,852.51	2
Fayette Co	15.81%	\$1,926.64	3
Owensboro	20.07%	\$8,414.56	6
Jefferson Co	23.39%	\$3,706.18	5

According to the data, there does not appear to be a linear relationship between these two variables. However, as those with high percentages of intergovernmental revenue tend to have higher aggregate debt in general, this variable as a determinant of debt will be revisited in further analysis.

Presence of Autonomous Authorities (Aut)

Figure 7 illustrates those municipalities identified as having autonomous Public Authorities and those who do not, per Appendix D, as well as the amounts and ranks of aggregate debt per capita. If the hypothesis that autonomous Authorities are associated with higher aggregate debt per capita is true, we would expect to see a positive correlation between the variables.

Figure 7

Fayette Co	0	\$1,926.64	3
Florence	0	\$2,058.27	4
Paducah	1	\$834.95	1
Bowling Green	1	\$1,852.51	2
Jefferson Co	1	\$3,706.18	5
Owensboro	1	\$8,414.56	6

Based on the data, there does not appear to be any correlation between the two variables. To substantiate this initial perception any possible relationship between the two will be more closely examined in the subsequent analyses.

Through basic interpretation of the data obtained, we can see that a few variables seem to have some correlation with aggregate debt in the selected municipalities. The following section further examines these possible relationships using statistical methods.

Statistical Analysis

Correlation Coefficients

First, in order to examine the basic correlations between the variables, the coefficients of correlation were determined and are shown below.

Aggregate Debt	
AggDebt	1.0000
AuthDebt	0.1585
Aut	0.3213
InterRev	0.5789
TaxRev	-0.8889

PropVal -0.1567

Dens 0.8106

PopShift -0.0596

The primary variable of interest in this study, the presence of autonomous Authorities (Aut), has a relatively weak positive correlation with the dependent variable aggregate debt (AggDebt). According to the data, there is little correlation between the presence of autonomous Authorities, as defined by the study, and the levels of aggregate debt in the sample cities. This does not necessarily mean that no relationship exists but the data do not seem to support such a correlation.

Tax Revenue Per Capita (TaxRev), on the other hand, appears to have a strong negative correlation with aggregate debt. The data here support the theory that an increase in tax revenue per capita corresponds to a decrease in aggregate debt. It is possible that municipalities with higher tax revenue per capita rely less on debt financing than their counterparts with lower per capita revenues.

As hypothesized, population density (Dens) has a relatively strong positive correlation with aggregate debt. Though .8106 is far from a perfect correlation, it is a substantial correlation. The data support the theory that densely populated areas will have a higher level of aggregate debt per capita than sparsely populated areas. As mentioned earlier, this is likely due to the special public needs arising from urbanization such as dense and extensive infrastructure.

Intergovernmental revenue as a percent of total revenue (InterRev) has a weaker positive correlation with aggregate debt with a coefficient of .5789. This correlation is not causal but, more likely, arises from municipalities turning to both intergovernmental aid and debt financing to compensate for a lack of available funds. In other words, a

municipality with relatively little available funding may turn to debt financing and qualify for intergovernmental aid to a greater extent than those with greater available funds. It seems logical that InterRev and AggDebt would be correlated, as municipalities rely on both for the same reasons. The coefficient is, however, not as strong as expected. This may be attributable to the small sample size, as intergovernmental revenue is generally an accepted indicator of levels of municipal debt.

The correlation coefficients displayed above support the hypotheses that tax revenue per capita, population density, and to a lesser extent, intergovernmental revenue as a percent of total revenue have some correlation with aggregate debt. However, the rest of the variables hypothesized to correlate with aggregate debt have relatively weak associations with the dependent variable. This may be due in some part to the small sample size and or the threats to internal validity discussed later. In other words, this does not mean we should rule out these variables as determinants of aggregate debt. However, the data only support the hypotheses that tax revenue per capita and population density are accurate determinants of aggregate debt.

Regression

To further analyze the relationships between the independent and dependent variables in this study, those variables for which the initial analysis suggested a correlation were subjected to simple regression analyses. First, tax revenue per capita was found in the initial analysis to correlate negatively with aggregate debt. To further examine this association, the following regression model was used:

$$Y_i = \beta_0 + \beta_1 X_i + \varepsilon_i$$

Where:

Y_i = Aggregate debt per capita (AggDebt) for the population of Kentucky cities

β_0 = Slope for AggDebt for Kentucky cities

β_1 = Slope for TaxRev for Kentucky cities

X_i = Tax Revenue Per Capita (TaxRev) for the population of Kentucky cities

ϵ_i = Random error in Y for observation i

The regression model was intended to determine the association between the independent variable tax revenue per capita and the dependent variable aggregate debt (AggDebt) at the .05 level of confidence and $n = 6$. A simple regression model was chosen in light of the sample size which, due to time constraints, was insufficient for a more complex multivariate regression analysis. The analysis determined that tax revenue per capita has a statistically significant negative correlation with aggregate debt per capita at the .05 level of significance, with a t value for (TaxRev) of -3.88 and $p = .018$. The analysis produced a regression coefficient of -19.02151 for TaxRev, meaning that for each increase in one dollar of tax revenue per capita, the aggregate debt of the municipality is predicted to decrease by \$19.02. This is a significant finding confirming the hypothesis that tax revenue per capita has a negative correlation with aggregate debt per capita. As hypothesized, it is likely that those municipalities with higher revenues per capita are less inclined to finance the provision of public goods through the issuance of debt than those with lower per capita revenues.

To test the association between population density and aggregate debt, a similar regression model was constructed as follows:

$$Y_i = \beta_0 + \beta_1 X_i + \epsilon_i$$

Where:

Y_i = Aggregate debt per capita (AggDebt) for the population of Kentucky cities

β_0 = Slope for AggDebt for Kentucky cities

β_1 = Slope for Dens of Kentucky cities

X_i = Population density per square mile (Dens) for the population of Kentucky cities

ϵ_i = Random error in Y for observation i

This model was intended to examine the association between density and aggregate debt per capita at the .05 level (95% confidence) where $n = 6$. The results of this model confirm the likelihood of a positive correlation between the independent variable (Dens) and the dependent variable (AggDebt) with a Dens t-statistic of 2.77 and a p value of .05. The regression coefficient for Dens in the model is 2.79309, which predicts that each additional person per square mile will correlate with an additional \$2.79 of aggregate debt in the municipality. Thus, the hypothesis that a positive correlation exists between population density and aggregate debt per capita in Kentucky's cities is confirmed by the model. This makes logical sense, as mentioned earlier, that municipalities with dense populations would have a greater need for expensive infrastructure projects and urban programs. However, we must take caution in generalizing the results shown here. The p value is probably acceptable for this model but only by a tiny margin. Moreover, such a small sample precludes us from accurate generalization.

Since the two simple regression models confirmed the theories that correlations exist between both TaxRev and Dens and aggregate debt, a multivariate analysis was attempted to further evaluate the associations. This was done with the understanding that $n = 6$ may have been too small for an effective model of this type. Nevertheless, it was a

notion worth attention. For this model

$$Y_i = \beta_0 + \beta_1 X_i + \beta_2 X_2 + \varepsilon_i$$

Where:

Y_i = Aggregate debt per capita (AggDebt) for the population of Kentucky cities

β_0 = Slope for AggDebt for Kentucky cities

β_1 = Slope for TaxRev for Kentucky cities

X_i = Tax Revenue Per Capita (TaxRev) for the population of Kentucky cities

β_2 = Slope for Dens of Kentucky cities

X_2 = Population density per square mile (Dens) for the population of Kentucky cities

ε_i = Random error in Y for observation i

This model was devised to simultaneously evaluate the associations between the two independent variables (TaxRev and Dens) and the dependent variable aggregate debt per capita (AggDebt) in Kentucky's cities. As before, this model was constructed at the .05 level of confidence with $n = 6$. However, the results of this analysis did not support the model as a good fit. The t-values for Tax Rev and Dens were low, at -1.38 and .07 respectively. Moreover, the p values for each variable were significantly higher in the combined model, at .261 for TaxRev and .947 for Dens. For the data in this study, with a small sample, the multivariate regression model was not a good fit and neither independent variable was statistically significant.

Analysis of Autonomous Authorities

Even though the dichotomous variable constructed to represent the presence of autonomous Public Authorities or special purpose entities did not yield a positive

coefficient sufficient to support the hypothesis of correlation between the variable and aggregate debt per capita, other empirical analyses were pursued to verify the findings.

First, the data were subjected to a t-test for differences in the means of two groups. The six municipalities in the sample were divided into two samples to represent two separate populations of Kentucky's cities, those with autonomous Public Authorities and those without. This was a simple matter of placing those municipalities with a value of 0 in the Aut row of Appendix D into group one, representing those without autonomous Authorities, and those municipalities with a value of 1 in the Aut row of Appendix D into group two, representing municipalities with autonomous Authorities.

This analysis was conducted to test for differences between the mean aggregate debts per capita of the two groups with the hypotheses:

$$H_0 : \mu_1 \geq \mu_2 \text{ or } \mu_1 - \mu_2 \geq 0$$

$$H_1 : \mu_1 < \mu_2 \text{ or } \mu_1 - \mu_2 < 0$$

A one tailed test was used to test the alternative hypothesis that the mean of group one was less than the mean of group two, or that municipalities with autonomous Public Authorities will have a higher aggregate debt per capita than those without autonomous Authorities. For this test, group one $n = 2$ and group two $n = 4$ with four degrees of freedom and assuming equal variances.

The results of this analysis were not sufficient to reject the null hypothesis, with a t-statistic of $-.68$ and a p value for the one tailed test of $.27$. This means that there is not sufficient evidence that the presence of autonomous Public Authorities results in an increase in aggregate debt per capita. According to the data obtained in this study, there is no significant difference in the mean aggregate debts of municipalities with

autonomous Authorities and those without autonomous Authorities.

To substantiate this conclusion, one final empirical analysis was conducted; a Wilcoxon Rank Sum Test for differences between two medians. For this analysis, the two groups were identical to those used in the t-test described earlier and used to test the hypotheses

$$H_0 : M_1 \geq M_2$$

$$H_1 : M_1 < M_2$$

The test was designed to determine if sufficient evidence exists that those municipalities with autonomous Authorities have higher median aggregate debts per capita than those without autonomous Authorities. In order to perform this test, the observations in each group are assigned ranks based upon values of aggregate debt per capita with total sample size $n = 6$. The analysis yielded a T1 test statistic of 5 and a Z test statistic of -0.93. For the upper tail test, the critical value is 1.65 and the p value is .82. Thus, we must not reject the null hypothesis. The results of this analysis do not provide sufficient evidence that the median aggregate debts per capita are higher in municipalities with autonomous Authorities than in those without such Authorities.

Aggregate Debt Compositions

To further examine the use of Public Authorities in Kentucky, it is useful to take a closer look at the compositions of the aggregate debts in each municipality. The following figures demonstrate the amount of the aggregate debt in each municipality and the portions of the aggregate directly issued by municipal governments (either revenue or general obligation) as well as those portions issued by Authorities. The statistics were derived from the 2003 debt report from the Kentucky Governor's Office for local

development, comprehensive annual financial reports, and direct interviews with administrators. The figures below demonstrate how much variation can exist in the use of Public Authorities from one government to another.

<u>Municipality</u>	<u>Municipal Debt</u>	<u>Authority Debt</u>	<u>Aggregate Debt</u>	<u>Authority Debt/Aggregate</u>
Bowling Green	\$81,271,903	\$12,581,671	\$93,853,574	13.4%
Florence	\$36,943,333	\$13,873,334	\$50,816,667	27.3%
Fayette Co.	\$502,885,753	\$11,139,047	\$514,024,800	2.1%
Jefferson Co.	\$389,639,000	\$2,201,040,391	\$2,590,679,391	84.9%
Owensboro	\$60,901,234	\$396,110,601	\$457,011,835	86.7%
Paducah	\$10,289,505	\$11,056,046	\$21,345,551	51.8%

It is important to mention again at this point that these figures are not reported by the local governments. You will not find these numbers anywhere on the government's financial reports nor will you find them on file with state offices. The municipal governments report their debts on their annual financial reports and sometimes include Public Authorities as component units. Other times they do not include Authorities at all. The Governor's Office for Local Development releases an annual report of local debt statistics as well. However, like the local governments, the state report does not differentiate between direct municipal obligations and Public Authority obligations. The report does account for public corporations according to the U.S. Census definition but that definition does not encompass all special purpose governments.

For these figures, the study used the complete listing of outstanding obligations for each government and determined on an individual basis, according to the definition of Public Authorities herein, which issues were municipal and which were obligations of special purpose entities. As a result of this interpretation, the exact figures are certainly

debatable. However, when one considers the enormous disparity between the percentages of Authority debt in each municipality shown above, the point remains clear. There is a great deal of variation in the debt issuance of Public Authorities across the municipal governments of Kentucky.

We can draw a few other conclusions from this information. First, qualitative variables such as political climates, administrative preferences, and constituent preferences may have as much to do with the debt issuance of local governments as the determinants used in this study. Not only is there a great deal of variation in the amounts of the aggregate debts per capita across the municipalities, but the compositions of the aggregates vary tremendously. This is likely in large part a result of the individual preferences of the cities. Some local governments, like in Fayette County, clearly prefer to more directly control the provision public services and, by extension, the issuance of debt. On the other hand, Jefferson County and Owensboro seem to prefer the creation of separate Authorities as a means to provide services and issue debt. In fact, this notion was confirmed in interviews with Fayette County administrators, who explained that Lexington-Fayette Urban County Government simply has never relied that heavily upon Authorities. The simplicity of the statement demonstrates how much precedent and political-administrative preferences can weigh-in on a government's decisions regarding service provision and financing.

Perhaps the most apparent conclusion to be drawn from the collection of this data is the imperfection and lack of transparency of information in Kentucky's local governments. As mentioned earlier, the single most substantial obstacle to this study was that information is simply not readily available. The acquisition of the data in this study required a great deal of time, persistence, and most importantly, interpretation. As a

result, ten different observers might derive ten different sets of figures from the financial information available. The local governments in this study do not adequately, if at all, report the existence or activities of Public Authorities in their jurisdictions. The debt levels they report in their financial reports do not reflect the total levels of publicly held debt in the municipalities. In some cases, they do not even come close.

This is not to say that the governments in this study are intentionally concealing debt. It is nothing so sinister. The fact is, each government has an accounting and reporting system and, while they are quite uniform, differences clearly exist with regard to the reporting of Public Authorities. While this is not a catastrophic problem, it is still a problem. When the activities of a group of entities that issue at least 80% of the public debt in a jurisdiction are not reported, there is clearly a lack of transparency and the public remains in the dark with regard to the activities of entities that provide some of their most vital public services.

Conclusions

The analysis of the data collected for this study offers us some insight into the relationship between Public Authorities and aggregate debt, as well as other factors that influence aggregate debt levels in Kentucky's municipalities. First, we may conclude that there is a significant negative correlation between tax revenue per capita and aggregate debt per capita. The data show us that increases in the former correspond to a decrease in the latter. This may or may not indicate a causal relationship and further analysis would be necessary to substantiate such a claim. What can be said, however, is that tax revenue per capita is at least in some way linked to aggregate debt in Kentucky's municipalities. Logically, or at least intuitively, we might conclude that governments with higher per

capita tax revenues might not rely as heavily on debt financing as do governments with lower tax revenues. The results of the analysis support this notion.

Another extension of this conclusion, though not as simple, may follow from the supposition that municipalities having higher tax revenues per capita may have so in part because of more affluent residents. Supposing this, it might follow that a municipality with relatively affluent residents may contain private firms that provide some of the goods often provided by Public Authorities or other such entities that contribute to levels of aggregate debt. To illustrate this notion, suppose City A is a suburb made up of residents with relatively high individual incomes. This per capita income provides a market for the private provision of goods or services, such as health care, that might be publicly provided in a less affluent city. Such public provision of goods is often facilitated by debt financing through vehicles other than traditional governments, which contribute to higher aggregate debt.

If this is the case, tax revenue per capita may have a multifaceted correlation with aggregate debt. In other words, tax revenue may be associated with aggregate debt in that 1) higher revenues precipitate less reliance on debt financing 2) higher tax revenues per capita often result from higher per capita incomes and these incomes produce markets in which the private provision of goods reduce the reliance upon public provision, in effect reducing the need for projects requiring debt financing. Such extensions to the association between tax revenue and aggregate debt may be numerous and are well beyond the scope of this study. This is just an illustration demonstrating that the data support the theory that tax revenue per capita is negatively correlated with aggregate debt in Kentucky's cities but that further analysis would be necessary to determine whether or not this relationship is causal.

The practical conclusions here are logical enough and likely apply to the population of Kentucky's municipalities. As high per capita aggregate debt is never desirable, although sometimes a necessary consequence of public/social improvements, Kentucky's municipalities should consider the idea that tax revenue is tied to aggregate in several ways. It seems commonsensical to postulate that increasing tax revenue will reduce the reliance upon debt financing. However, municipalities might find that exploration of the association between tax revenue and aggregate debt would yield more complex conclusions that may aid them in understanding the nature and causes of accelerated aggregate debt.

In addition to substantiating tax revenue per capita as a determinant of aggregate debt per capita, the data support the theory, although to a lesser extent, that population density is positively correlated to aggregate debt. Although the data do not provide as strong or statistically significant evidence of this correlation as for that correlation between tax revenue and debt, some correlation is evident and precedent compliments and bolsters the findings. Other studies have identified population density as an effective determinant of municipal debt and, by extension, aggregate debt. The analysis of the data here tends to support prior findings. Though marginally so, the results of the model examining the correlation between density and aggregate debt are statistically significant. Even though the results of the analysis are not as powerful as one might expect, likely due in some part to the aforementioned problem of the sample size in a regression analysis, when combined with what we have learned from other studies about the association density and debt, it is likely that these results can be applied to the population of Kentucky municipalities. Again, this may be presumptuous, based upon the sample size, but when one considers the precedent of density as a determinant of debt and the

logical sense of the argument, I am prepared to stipulate that this also applies in Kentucky.

As with the findings regarding the previous variable, the practical implications of these results focus primarily on understanding aggregate debt. It may be useful for a municipality and its constituents to understand that population density is positively correlated with aggregate debt and view its own levels of outstanding debt in that context. For example, when evaluating the financial management of a municipal government, it may be useful to remember that research suggests that high density areas incur more debt than sparsely populated ones. This is not to say that densely populated areas cannot avoid accelerated debt issuance. In fact, the very understanding of this trend may help governments examine what activities, programs, or entities are contributing to high or undesirable levels of aggregate debt and determine how to curtail the rate of issuance. A municipality cannot likely control what it does not understand, especially in a case like aggregate debt, where issuance is decentralized and obligation is ambiguous. Understanding the factors that affect or seem to affect aggregate debt, like population density, is instrumental in monitoring and controlling issuance.

The hypothesized determinant of aggregate debt of principal interest to this study is the presence of autonomous Public Authorities or special purpose entities. The main goal of this study was to address the role of Public Authorities or special purpose entities in determining the aggregate debt of a municipality. Specifically, this study was aimed at determining whether the use of autonomous Public Authorities seemed to lead to increased levels of aggregate debt. Early on, this study discussed the two sides of the argument over the use of Public Authorities. Those who support Authorities as purveyors of goods argue that their independence and expertise make them ideal for certain

missions. Critics argue that Authorities are primarily vehicles used to circumvent debt limitations and that they can be subject to mismanagement, especially financially, in which case their autonomy may lead to undesirable levels of debt issuance. The primary goal of this study was to determine if evidence exists to support the theory that Authorities with great degrees of autonomy take advantage of this freedom to issue more debt. The logic here is that, if relatively autonomous Authorities are issuing larger volumes of debt in Kentucky's municipalities, the aggregate debts per capita of municipalities with autonomous Authorities would generally exceed those of their counterparts who tightly control the activities of their Authorities. In short, this study attempted to discern whether those Authorities with the freedom to issue debt with relative impunity are doing so in Kentucky's cities and, by extension, endangering the financial positions of their creator governments.

In order to accomplish this task, this study included several test to examine the relationship between the presence of autonomous Authorities and aggregate debt per capita. First, Public Authorities were identified and categorized and those municipalities granting autonomy to its Authorities, per Appendix C, were identified. According to the data obtained four of the six municipalities sampled utilized autonomous Authorities and two did not. Upon first analysis, there appeared to be little relationship between the presence of such Authorities and aggregate debt. There was no immediately evident trend demonstrating higher aggregate debts per capita in those municipalities with autonomous Authorities than those without.

To test the correlation between the presence of autonomous Authorities and aggregate debt, the correlation coefficients were determined. This method produced no evidence of correlation between the variables and thus, we could not conclude that any

association exists between the two. To further examine the possibility of association, a t-test was performed to determine if the presence of autonomous Authorities correlates with a difference in the average levels of aggregate debt per capita in the municipalities. As before, there was no evidence suggesting that such a relationship exists. Finally, the same data were subjected to a Wilcoxon rank sum test to search for evidence that municipalities with the Authorities were incurring higher levels of aggregate debt per capita than those without such Authorities. Again, no evidence of significance was found to support this theory.

Despite a few drawbacks, these analyses tell us a few important things about Public Authorities and aggregate debt. First, there is no evidence in the data that autonomous Authorities, as defined by this study, are leading to increased debt issuance in Kentucky's cities. If the data are accurate and generally representative of Kentucky's municipalities, this seems to support the proponents of Public Authorities. At the very least, the study supports proponents of Authorities by default, in that it provides no evidence that their use is leading to increased debt issuance. This does not conclusively mean that Authorities with relatively high degrees of autonomy are harmless or that critics of Authorities are unfounded. Critics of Authorities can always argue the potential for financial mismanagement. However, this study does not provide critics any ammunition for their assault on Authorities. In other words, autonomous Authorities, by their definition, have the potential to issue undesirable amounts of debt and thus affect the financial position of their creator governments. According to the data collected from Kentucky's municipalities, however, they do not appear to be doing so.

Public Authorities or special purpose entities are sometimes used to avoid the direct obligation of debt or circumvent debt limitations and some scholars have

concluded that they are largely created for financial rather than administrative motives. (Leigland, 1994) However, there is no evidence here that those municipalities granting high degrees of freedom to their Authorities are incurring higher levels of aggregate debt.

It is quite possible that the disparities in the levels of aggregate debt are the result of several variables that can be measured, such as tax revenue and population density, and several variables that cannot be quantified. It is likely that one of the most important determinants of aggregate debt falls into the latter category. Some municipalities, such as Paducah, simply choose to avoid debt as part of their standard procedures or political choices. On the other hand, cities such as Owensboro are apparently much more comfortable with large amounts of Authority debt. It is worthwhile to note again that in cases such as Owensboro, the city does not have an abnormally high amount of general obligation debt outstanding. (See Appendix D) It just has a large amount of revenue and Authority debt. This demonstrates that some cities, while they may not be dangerously encumbering future revenue with general obligation debt service, are not bashful about the use of revenue debt, particularly when using Authorities as a vehicle. In other words, it is probable that much of the difference between the levels of aggregate debt in the municipalities results from debt-averse political climates and matters of constituent preference.

While there are numerous limitations to this study, as discussed earlier, it does demonstrate a lack of correlation between autonomous Authorities and aggregate debt. Moreover, it confirmed two possible determinants of aggregate debt in tax revenue, with a negative correlation and population density, with a positive correlation. With respect to the use of Public Authorities, there is no evidence here that Kentucky's municipalities need to take any new measures to control debt issuance. It seems that the controls and

limitations built into the charters of Authorities, even those with relative freedom of financial management, combined perhaps with the professionalism of directors and leaders is containing debt issuance.

In order to further examine the relationships between these variables and perhaps verify the findings of this study, it would be necessary to first expand the sample size of municipalities to make the analysis more generalizable. If this was done, we could further explore the subject matter of this study with a multivariate regression model to examine the hypothesized determinants of aggregate debt. If time and resource constraints permitted, a regression model with a larger sample might substantiate the results of this study. Perhaps the model

$$Y = I + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + E$$

Where:

Y = Aggregate Debt per Capita

I = Intercept

X₁ = Population Density (per square mile)

X₂ = Tax Revenue Per Capita

X₃ = Intergovernmental Revenue as a Percentage of Total Revenue

X₄ = Presence of Autonomous Authorities (Dichotomous Variable)

E = Standard Error

or something of the like might provide us with a better understanding of the association between Public Authorities, as well as other hypothesized determinants, and aggregate debt.

One of the most important conclusions reached in this study concerns the information regarding Public Authorities in Kentucky. It seems that these entities exist in relative obscurity among the population of the Commonwealth's governmental bodies. Creator governments in far too many cases have little knowledge or understanding of the specific activities of Authorities. Even if control is relinquished considerably to Authorities, it may be wise to maintain some degree of surveillance. This would allow for two desirable results. First, if the creator government is explicitly aware of the activities of its Authorities, it may be able to discourage or correct activities it deems detrimental to its own financial position. Moreover, if it maintains awareness of the activities of its Authorities, it may be able to learn from these activities and refine its future use of special purpose entities.

The second main advantage of maintaining at least some level of surveillance over Authorities is to provide for better transparency for constituents. Authorities provide some of the most visible services to residents, yet the nature of their administrative and financial activities remains obscured from public view. There are no repositories for this information and its location and collection is tedious. As result, constituents in a democratic process often have little knowledge of the activities of governmental entities that provide some of their most vital services.

Bibliography

- Axlerod, Donald. *Shadow Government*. New York: John Wiley & Sons, Inc. 1992.
- Croft, RA and GD Wendel, "The Determinants of municipal debt policy: a pooled time-series analysis," *Environment and Planning C: Government and Policy*, Vol. 16, London, England: Pion Ltd, 1998
- Eger, Robert J. III. *Public Authorities: Their Role in State Government Financial Management*. Lexington, KY: University of Kentucky, Unpublished Dissertation, 2000.
- Governor's Office for Local Development (GOLD), Commonwealth of Kentucky. *Kentucky Local Debt Report: FY 03 – FY 04*. http://www.gold.ky.gov/finance/debt/debt_report.htm. 2004.
- Leigland, James. "Public Authorities and Determinants of Their Use by State and Local Governments," *Journal of Public Administration, Research and Theory*, Vol. 4, 1994, ps. 521-544.
- Leigland, James and Robert Lamb. *WPP\$\$: Who is to Blame for the WPPSS Disaster*. Ballinger Publishing Co. 1986.
- Mitchell, Jerry. "The Policy Activities of Public Authorities," *Policy Studies Journal*, Vol. 18, No. 4, 1990.
- Mitchell, Jerry. "Public Authorities and Government Debt: Practices and Issues," In *Handbook of Debt Management*, Gerald J. Miller, ed., New York: Marcel-Dekker, 1996, pp. 141-160.
- Wolff, Guntram B. "Fiscal Crises in U.S. Cities: Structural and Non-structural Causes," Working Paper, Center for European Integration Studies, Germany: Rheinische Friedrich-Wilhelms-Universität Bonn, 2004.