AN ECONOMETRIC ANALYSIS OF THE RELATIONSHIP BETWEEN NEW DEVELOPMENT AND LOCAL GOVERNMENT CAPITAL EXPENDITURES FOR USE IN ESTABLISHING RATIONAL NEXUS FOR THE IMPLEMENTATION OF IMPACT FEES

by

ALFRED BENJAMIN MEEK

(Under the Direction of Jeffrey H. Dorfman)

ABSTRACT

More than 90 percent of local governments impose land-use exactions as a way to finance needed infrastructure. Often those exactions include cash payments, also known as impact fees. The current legal basis for impact fees, as put forth by the Supreme Court of the United States, is the "rational nexus" criterion. Simply put, the rational nexus criterion says that there 1) must be a connection between the exaction and the purpose for which it is used, and 2) the exaction must demonstrate rough proportionality to the impact of the development. Therefore, the goal here is to develop a statistical, empirical analysis that meets the rational nexus criterion and provides a basis for an impact fee program that will provide sufficient funds to cover the capital costs that result from new development. In order to accomplish this goal, a series of fixed-effect panel data regressions were estimated using annual capital expenditures (by category) and digest values (by type) for all counties in the State of Georgia over a nine year period. This ex post, economic analysis of the cost of development is very different from the ex ante engineering analysis that has been the traditional method for establishing impact fees. The results show that the unique ex-post economic analysis developed here 1) establishes the rational nexus between new

development and the cost of capital needed to support that development and 2) produces results that are consistent with current impact fees and that in some cases can be used as the starting point for a local government impact fee program.

INDEX WORDS: impact fees, rational nexus, rough proportionality, local government finance, cost of development, infrastructure financing, capital financing

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DEDICATION

I would like to dedicate this work to my wonderful wife, Pilar, and my two sons, Aidan and Garrett for their support and patience while I completed my degree.

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CHAPTER 1

INTRODUCTION

Background

Over the past 40 years, land-use exactions have become a popular method for infrastructure financing in the United States. Exactions are a dedication of land or facilities (or cash in lieu of land/facilities) to the government. The power to demand exactions is a derivative of the power of local governments to regulate land use through zoning, which in turn is a derivative of the police power of the state (Snyder and Stegman 1986). Prior to 1960, only 10 percent of local governments imposed land-use exactions. Now, that number is well above 90 percent. In addition, prior to 1960 nearly all exactions were in the form of land donations or in-kind contributions and/or construction. Now, approximately 60 percent impose impact fees (cash payments) in addition to land exactions. Finally, prior to 1960 exactions were for core services (e.g., roads, water/sewer infrastructure, etc.). Now, exactions are imposed for everything from open space to social programs (Alshuler and Gomez-Ibanez 1993). Clearly, exactions are now the preferred method of financing needed infrastructure at the local level.

While the power to impose exactions is derived from the police power of the state, the current legal basis for how impact fees are implemented is the "rational nexus" criterion. Rational nexus was first put forth by the Supreme Court of Wisconsin in Jordan v. Village of Menomonee Falls in 1965. In that decision, the court upheld the constitutionality of the fee-in-lieu of exaction "if the evidence reasonably establishes that the municipality will be required to provide more land for schools, parks, and playgrounds as a result of approval of the subdivision"

(*Jordan v. Village of Menomonee Falls*, 1965). Prior to this ruling, the standard had been that the basis for the fee had to be "specifically and uniquely attributable" to the activity in question (*Pioneer Trust & Savings Bank v. Village of Mount Prospect*, 1961). However, the Wisconsin court felt that it would be impossible for any local government to meet such a strict standard.

Two later cases by the U.S. Supreme Court have further defined and clarified the rational nexus criterion. The first, Nollan v. California Coastal Commission in 1987 requires an "essential nexus" between the legitimate state interest (i.e., new infrastructure) and the condition the government has placed on approval (i.e., impact fee). The Nollans sought a permit from the California Coastal Commission to raze and then rebuild their beachfront home. The commission granted the permit on the condition that the Nollans give the public an easement to pass along a portion of their property, as it was located between two public beaches. Justice Scalia, in writing the opinion of the Court, states that "the lack of nexus between the condition and the original purpose of the building restriction converts that purpose to something other than what it was" (*Nollan v. California Coastal Commission*, 1987). In other words, there has to be a connection, or nexus, between the exaction and the purpose for which it is used.

The second case, Dolan v. City of Tigard in 1994 establishes how far the condition for development can go once an "essential nexus" is established. Chief Justice Rehnquist, in writing the opinion of the Court, states that the Court

> "granted certiorari to resolve a question left open by our decision in *Nollan v. California Coastal Commission* of what is the required degree of connection between the exactions imposed by the city and the projected impact of the proposed development" (*Dolan v. City of Tigard*, 1994).

The Court decided that not only must an essential nexus exist, but the condition must also demonstrate "rough proportionality" to the impact of the proposed development. Again, Chief Justice Rehnquist writes

> "No precise mathematical calculation is required, but the city must make some sort of individualized determination that the required dedication is related both in nature and extent to the impact of the proposed development" (*Dolan v. City of Tigard*, 1994).

The terms "nature" and "extent" in this quote capture the ideas of "essential nexus" and "rough proportionality" upon which impact fees must be based. For the purposes of this paper, these two ideas will be jointly referred to as "rational nexus."[1]

Purpose of the Study

Interestingly, Chief Justice Rehnquist's assertion that "no mathematical calculation is required" seems to have been taken to heart by the authors of most impact fee literature. As will be pointed out in the next chapter, the fact that cost recovery is rarely achieved in practice is due to the fact that jurisdictions don't set impact fees to cover the marginal cost of service (Downing and Frank 1983). In fact, impact fees are often set at average prices, which is lower than the cost of new service (Nelson and Moody 2003). However, even before you can attempt to calculate the marginal cost of service, the rational nexus between new development and local government

[1] Other courts and legislatures have expanded the rational nexus test. As it is most commonly applied, the rational nexus test includes such requirements as :

1. Development must benefit from facilities financed by impact fees
2. These facilities should be part of a comprehensive plan for service improvements
3. Fees must be expended within a reasonable amount of time
4. Fees should be spent within a zone or district where a development is located
5. Double taxation must be avoided by crediting development for other payments made to pay for these same infrastructure facilities.

However, in *Nollan* the Court did not explicitly adopt any of these requirements. (Altshuler and Gomez-Ibanez 1993) Therefore, for purposes of establishing rational nexus to address the problem presented later in this chapter, these requirements will not be considered.

capital expenditures needs to be firmly established. Again, as will be shown in Chapter 2, the current impact fee literature is void of a statistical, empirical analysis that demonstrates the clear nexus between new development, and the cost of capital to service that development. That is the gap that this study seeks to fill. Specifically, the goal here is to firmly establish a statistical relationship between new development (residential, commercial, and industrial) and capital expenditures — a relationship that may form the basis for an impact fee program that can pass the rational nexus test.

In addition, a review of the literature surrounding impact fees provides little in the way of an empirical analysis for the establishment of an impact fee methodology that 1) meets the rational nexus test, 2) equitably divides the cost between residential and non-residential development, and 3) provides adequate funds to cover the cost of service. These three characteristics are critical for an effective impact fee scheme, but they are not found together in the literature. For example, Snyder and Stegman (1986) talk extensively about the issues surrounding setting impact fees for roads, highways, water and sewer infrastructure, parks, schools, etc. that will satisfy the rational nexus criterion, but don't present a specific methodology for actually setting the fees. Conversely, in *A Practitioner's Guide to Development Impact Fees* (Nicholas, Nelson, and Juergensmeyer 1991) the authors present several methodologies for establishing the level of impact fees, but there is no methodology that ties all three of the previously mentioned attributes together. In addition to filling the empirical rational nexus gap, the research presented here may provide a methodology for combining these three characteristics.

CHAPTER 2

LITERATURE REVIEW

As one might imagine, there is ample literature on the topic of impact fees. In a recent paper, Nelson and Moody offer an excellent, "relatively comprehensive" overview of the impact fee literature. For the following review, I am going to use their organizational structure since much of the literature I am reviewing was also cited in their work (Nelson and Moody 2003).

Justification for Impact Fees

Historically, public facilities were financed via the general property tax. However, as mentioned in the introduction, impact fees are now the preferred method of financing needed infrastructure at the local level. Therefore, the question is why has this come to be?

In general, local governments have at their disposal three types of revenue ─ general taxes (i.e., property, sales, and income taxes), user charges (utilities, tolls roads, hospitals, etc.) and private revenue sources (i.e., special districts, exactions, impact fees, etc.) However, another way to categorize local government revenue is not by type, but by source, and there are only two ─ existing property owners or "someone else." It isn't hard to get existing property owners to agree that "someone else" should bear the cost of new infrastructure. In fact, it was this mentality that lead to the fiscal revolts of the 1970s and 80s that began to place restrictions on local government ability to tax real property. As the attitude regarding local government financing has shifted, governments have been forced to abandon the property tax as a means of financing infrastructure. (Nicholas, Nelson, and Juergensmeyer 1991). The burden has shifted

from existing property owners to someone else, namely, new property owners, often in the form of impact fees.

Even if this attitudinal shift had not occurred, however, it is still likely that impact fees would have evolved as a popular financing method. This is simply because, as several studies have shown, property taxes in and of themselves do not cover the full cost of capital needed to serve new development (Burchell and others 2000).

Economic Efficiency of Impact Fees

So we understand why impact fees have come into vogue, but are they an efficient mechanism for funding infrastructure? From microeconomics we know that when prices equal marginal cost, resources are allocated efficiently. We also understand that marginal cost pricing is a result of perfect competition. Further, we understand that taxes add to the market price and therefore create inefficiencies (Nelson and Moody 2003). So, the question is, are impact fees a tax which introduces inefficiency in the market, or are they part of an efficient price scheme for capital desired by consumers?

If we assume that in the long-run competitive conditions exist, then the cost of producing the good (both capital and operating costs) will be reflected in the price of that good. Downing and Frank (1983) suggest then that an efficient method for financing additional "public" capital would be to use a two-part pricing scheme that assumes a one-time charge for capital that reflects the proportionate share of the additional capacity (i.e., impact fee) plus a user-fee for periodic usage which reflects the costs associated with operating the infrastructure. Unfortunately, cost recovery is rarely achieved in practice (Snyder and Stegman 1986). However, this fact has little

to do with efficiency, and more to do with the fact that jurisdictions don't set impact fees to cover the cost of service (Downing and Frank 1983).

What about efficiency with respect to development? Brueckner (1997), using maximum aggregate land value as his measure of efficiency, compares the impact of three infrastructure financing schemes ─ impact fee, current sharing, and perpetual sharing ─ on urban development using an urban growth model developed by Capozza and Helsley in 1989. Brueckner's analysis showed that the current sharing and perpetual sharing schemes lead to lower aggregate land values than the impact fee scheme in the urban growth model. This conclusion formalized what had been argued in previous studies ─ that if the cost of capital is set at the marginal cost of new residents, private and social incentives are aligned and the result will lead to efficient urban growth.

Incidence of Impact Fees

Again, from our micro economic text books we understand that the incidence of a tax or fee refers to who actually pays it. It is easy enough to see who actually writes the check in the short-term, but determining to whom that cost is eventually passed is an important exercise. If impact fees are a way to pass the cost of new development on to new residents, it is important to make sure that new residents are actually bearing that cost.

Not surprisingly, as with other tax incidence, who bears the cost depends on the supply and demand conditions (or elasticities) of the housing market. If buyers are not sensitive to price changes, and there are no barriers to entry for developers, then buyers will pay the fee. If buyers are not sensitive to price changes and there *are* barriers to entry for developers, buyers still pay the fee, but low and middle income households are squeezed out as developers focus on higher

income households. However, the more common situation is that buyers are sensitive to price and there are no barriers to entry for developers. In this case, both buyers and developers share the burden in the short term. Developers may pay their share out of profits, but are more likely to offset their share by reducing size, quality, amenities, etc. Thus, in the long-term, buyers once again pay the fee. However, existing land owners may also absorb some of the fee as developers bid less for the land since the impact fees will decrease their rate of return (Huffman, et. al. 1988). Yinger (1998) provided a framework to formalize this analysis and found that in fact, one-quarter or more of the burden may fall on owners of undeveloped land. He further showed that impact fees result in a small windfall to owners of existing homes that are close substitutes for the new homes as prices are driven up due to the impact fee. Further, Yinger confirmed that if the housing construction market is competitive, developers will absorb little or no portion of the fee.

The previous discussion focused on residential development, but of course, the same holds true for non-residential development. In a competitive market situation, rents increase only if demand increases. If additional costs are imposed via impact fees, then the developer and tenant would share the fee based on their supply and demand conditions. And, as with existing residential owners, existing commercial owners receive a windfall when rents rise due to impact fees. (Huffman, et. al. 1988).

CHAPTER 3

DESCRIPTION OF THE DATA

Overview

This analysis will use data for the 159 counties in the State of Georgia. Most of the data used for this analysis was collected by the Georgia Department of Community Affairs (DCA). Each year, counties in Georgia are required to complete form F-65 (GA-1A), also known as "Report of Local Government Finances." Through this report counties provide detailed information to DCA regarding revenues and both operating and capital expenditures. (See Appendix A for a copy of this form.)

In addition to the DCA data, information about the tax digests of every county was gathered from the Georgia Department of Revenue Tax Digest Consolidated Summary. These summaries show the number of parcels/improvements, the number of acres, and the value of property by land zoning type, e.g., residential, commercial, industrial, agricultural, etc. (See Appendix B for an example of the tax digest consolidated summary.)

The dataset also includes some basic demographic/economic data from various government sources. These include population (Census Bureau), employment and unemployment (Georgia Department of Labor), and local area personal income (Bureau of Economic Analysis).

All of this data was compiled for the years 1994 through 2002. (The DCA data is not available prior to 1994, and at the time of this writing was not yet completed for any year beyond 2002.) This results in a cross-sectional time series data set with nearly 200,000 variables. The

dataset was compiled by researchers at Georgia Tech's Center for Innovation in Economic Development for use in the development of their Fiscal Impact Tool (FIT). Because of the author's prior working relationship with the faculty members in the center, they have graciously shared their proprietary data for use in this research.

Adjustments

For this analysis, only the value of residential, commercial, and industrial improved property, as well as capital expenditures (construction and equipment) for each county are needed. This data was extracted from the larger dataset and the variable names and descriptions are listed in Table 1.

Table 1
Variable Names and Descriptions

Variable Name	Description
resimpv	Value of residential improved properties
comimpv	Value of commercial improved properties
indimpv	Value of industrial improved properties
geneq	Equipment expenditures for General Administration
gencon	Construction expenditures for General Administration
pubweq	Equipment expenditures for Public Works
pubwcon	Construction expenditures for Public Works
crteq	Equipment expenditures for Courts
crtcon	Construction expenditures for Courts
pseq	Equipment expenditures for Public Safety
pscon	Construction expenditures for Public Safety
hlteq	Equipment expenditures for Public Health
hltcon	Construction expenditures for Public Health
sweq	Equipment expenditures for Social Welfare
swcon	Construction expenditures for Social Welfare
recleq	Equipment expenditures for Recreation and Libraries
reclcon	Construction expenditures for Recreation and Libraries
ffeq	Equipment expenditures for Miscellaneous
ffcon	Construction expenditures for Miscellaneous

The first adjustment of the data was the combination of the commercial and industrial digest values. The initial intent of this research was to allocate the cost of development among all three types of property. However, in 1992 the Georgia Legislature revised the process of digest submission for the counties. The rules tied to that legislation did not clearly define what constituted "commercial" vs. "industrial" property. It wasn't until the late 1990s that the Georgia Department of Revenue (DoR) clarified the rules for property classification. At that time, the values of commercial and industrial properties on the digests of many counties changed significantly as local tax assessors re-classified property one way or another to comply with the new definitions. In fact, an analysis of the dataset reveals that during the late 1990s, at least 35 counties showed large jumps in the value of either the commercial or industrial digest with corresponding declines in the other. As a result, any time-series analysis of the digest values in Georgia must combine commercial and industrial property since the individual series are not consistent. The resulting variable was "cniimpv" — the combined value of commercial and industrial improved properties.

The second data adjustment was for inflation in an attempt to isolate "new" growth from "inflationary" or "re-assessment" growth. Obviously, in order to establish a nexus between the cost of infrastructure and new development, the new capital expenditures of interest here need to be correlated with new growth, not growth that is a result of inflationary pressures. Similarly, the expenditure data itself needs to be adjusted from nominal to real dollars. It isn't appropriate to simply adjust the entire dataset using the standard Consumer Price Index for all Urban Consumers (CPI-U). To the extent possible, the data should be adjusted using an inflation indicator that is closely related the data itself. While this is not always possible, an attempt was

made here to adjust the data appropriately. Table 2 shows the inflation indicator that was used for each variable in the dataset.

Table 2
Inflation Adjustments

Variable Name	CPI/PPI/Index Name	Series ID
Digest Improvements		
Residential Improvements	Georgia Housing Price Index	
Com./Ind. Improvements	PPI – Non-residential Buildings	PPI-BBLD
Construction Expenditures		
General Government	PPI – Non-residential buildings	PPI-BBLD
Public Works	PPI – Heavy Construction	PPI-BHVY
Courts	PPI – Non-residential Buildings	PPI-BBLD
Public Safety	PPI – Non-residential Buildings	PPI-BBLD
Public Heath	PPI – Non-residential Buildings	PPI-BBLD
Social Welfare	PPI – Non-residential Buildings	PPI-BBLD
Recreation	PPI – Non-residential Buildings	PPI-BBLD
Miscellaneous	PPI – Non-residential Buildings	PPI-BBLD
Equipment Expenditures		
General Government	CPI – Info. Technology & Hardware	CUUR0000SEEE
Public Works	PPI – Construction Machinery	WPU112
Courts	CPI – Info. Technology & Hardware	CUUR0000SEEE
Public Safety	CPI – New Vehicles	CUUR0000SETA01
Public Heath	CPI – Info. Technology & Hardware	CUUR0000SEEE
Social Welfare	CPI – Info. Technology & Hardware	CUUR0000SEEE
Recreation	CPI – Sporting Goods	CUUR0000SERC
Miscellaneous	CPI – Durables	CUUR0000SAD

The Georgia Housing Price Index from the Office of Federal Housing Enterprise Oversight was used to adjust new residential improvements. Similarly, the PPI for non-residential buildings was used to adjust new commercial and industrial improvements.

With respect to construction expenditures, all but one of the expenditure categories were adjusted using the PPI for non-residential building construction. Only one category, public works construction, used a different inflation index — the PPI for heavy construction.

Finally, all but one category of equipment expenditures were adjusted using CPI data. The bulk of equipment expenditures for general government, courts, public health offices, and social welfare offices are computers. Therefore, these expenditures were inflation adjusted using the CPI for information technology and hardware. Similarly, the majority of the cost of public safety equipment would be the vehicles, so these expenditures were adjusted using the CPI for new vehicles. Recreation equipment expenditures were adjusted using the CPI for sporting goods, and miscellaneous equipment expenditures were adjusted using the CPI for all durable goods. Because there is no CPI index that closely relates to public works equipment, rather than use the CPI for durables, the PPI for construction machinery was used. Using these indices, all the variables were restated in 2002 dollars and a "02" was added to the end of the variable name to distinguish the inflation adjusted series from the original data. Only the inflation adjusted data was used in the final analysis.

Once the data were adjusted for inflation, the next adjustment was to combine the construction and corresponding equipment expenditures into a capital expenditure variable for each category of expenditures. For example, inflation adjusted public safety construction (pscon02) and inflation adjusted public safety equipment (pseq02) were combined into a public safety capital expenditures variable (pscap02).

Finally, due to the large numbers in dataset, the data were scaled into the millions of dollars. For example, the value of the residential improvements for Gwinnett County in 2002 was more than $8 billion. In regression analysis, these numbers are going to be squared and summed, and squaring a number in the $8 billion range would result in a 20-digit number. By scaling the data into millions of dollars, the largest of the squared numbers would have only 8 digits. Simply put, scaling the data allows for improved precision within the statistical software.

Grouping

Because the counties in Georgia vary widely in size, level of urbanization, rate of growth, and the extent to which they are developed, the counties have been segregated into ten groups. Nine of the groups used correspond to the United States Department of Agriculture (USDA) Economic Research Service Rural-Urban Continuum Codes. These codes distinguish metro counties (as defined by the Office of Management and Budget) by the size of their metro area. Non-metro counties are classified by the degree of urbanization and whether or not they are adjacent to a metropolitan area. There are nine county classifications ─ three metro and six non-metro. (Table 3 shows the codes, their definitions, and the number of counties in Georgia in each classification.) An additional group — Group 0 — was created by pulling Cobb, DeKalb, Fulton, and Gwinnett counties out of Group 1. The reason for this is that these four counties in the Atlanta Metropolitan Statistical Area are so much larger and more developed that the other counties in Group 1, that for purposes of this analysis, they needed to be analyzed independently.

Table 3
USDA Rural-Urban Continuum Codes

Code	Description	# in Georgia
Metro Counties		
1	County in metro area with 1 million population or more	28
2	County in metro area of 250,000 to 1 million population	14
3	County in metro area of fewer than 250,000 population	28
Non-metro Counties		
4	Urban population of 20,000 or more, adjacent to a metro area	7
5	Urban population of 20,000 or more, not adjacent to a metro area	0
6	Urban population of 2,500-19,999, adjacent to a metro area	41
7	Urban population of 2,500-19,999, not adjacent to a metro area	15
8	Completely rural or less than 2,500 urban population, adj. to metro	15
9	Completely rural or less than 2,500 urban population, not adj. to metro	11

Source: USDA, Economic Research Service

Again, because these counties vary widely in size and level of development, and because some of these classifications contain only a few counties, for the following analysis they were re-

aggregated into five groups — "Super Metro" (Group 0); "Atlanta Metro" (Group 1); "Smaller Metro" (Groups 2 and 3); "Non-Metro Urban" (Groups 4, 5, 6, and 7); and "Rural" (Groups 8 and 9). Since impact fees are used to finance needed infrastructure which is a result of growth and development, these groups were organized around having similar densities which is a proxy for the level of development. The average 2002 densities, measured in persons per acre, are listed in Table 4.

Table 4
Average Density per Acre for County Groups

Group	Density per Acre	Standard Deviation of Average Density per Acre
Super Metro	2.93	0.37
Atlanta Metro	0.47	0.11
Smaller Metro	0.28	0.05
Non-Metro Urban	0.10	0.01
Rural	0.05	0.01

Use

The methodology proposed here is actually very simple, but relies on the extensive dataset described above. In order to establish a nexus between new development and the cost of additional infrastructure, a series of fixed-effect panel data regressions using annual capital expenditures (adjusted for inflation) as the dependent variable, and several lags in residential, and commercial/industrial real property digest values (adjusted for inflation, so that changes reflect new growth only) as independent variables. In some cases, the expenditures may occur before the development (e.g., roads, water/sewer, etc.). In these cases rather than using lags in the real property digests, a set of "forwards" (for lack of a better term) could be created and used as independent variables.

The results of these regressions should show the marginal contribution to capital expenditures that development for each property type has over time. The coefficients on the variables represent a starting point for an impact fee scheme that meets the rational nexus criterion. These coefficients would be estimates of the increase in capital expenditures from new development and should allow calculation of the funds needed to cover the cost of new infrastructure. This type of ex post, economic analysis of the cost of development is very different from the ex ante engineering analysis that has been the traditional method for establishing impact fees.

According to the Official Code of Georgia Annotated (O.C.G.A.) § 36-71-1, (a.k.a. The Georgia Development Impact Fee Act) in Georgia, only certain public facilities are eligible to be considered when assessing impact fees. Those facilities include:

1. Water supply production, treatment, and distribution facilities
2. Wastewater collection, treatment and disposal facilities
3. Roads, streets and bridges, including rights of way, traffic signals, landscaping and any local components of state or federal highways
4. Stormwater collection, retention, detention, treatment and disposal facilities, flood control facilities, and bank and shore protection and enhancement improvements
5. Parks, open space and recreation areas, and related facilities
6. Public safety facilities, including police, fire, emergency medical and rescue facilities
7. Libraries and related facilities.

The methodology presented here could be applied to all categories of capital expenditures. However, because the dataset is comprised of Georgia counties, for purposes of this analysis, the focus will be on those capital expenditures that are eligible for impact fees in Georgia. Specifically, the analysis will focus on three of the above categories whose capital expenditures clearly lag development — public safety facilities, recreation, and libraries. If the

analysis proves useful, it could be extended to other capital expenditure categories, including public works which would use the "forward lag" structure mentioned earlier.

The dataset was imported into STATA (Intercooled STATA 7.0) and multiple programs (or "do files" in STATA terminology) were run that scaled the data and generated the necessary capital expenditure variables as well as lagged values of the residential, commercial/industrial improvements. (Appendix C contains all the do-files used in this research).

CHAPTER 4

ANALYSIS RESULTS

Lag Length and Shape

Obviously, the response of a local government to the infrastructure needs of new development is not instantaneous. With respect to public safety (e.g., fire stations, police precincts, etc.), libraries, and recreation facilities, the infrastructure usually lags development by a number of years. The question becomes what is the number of years over which infrastructure is put in place to meet the needs of the development. As described in Chapter 3, the dataset used here provides nine years of data. Therefore, lag lengths of 3, 4, 5, and 6 years were tested to establish the lag length for each type of capital expenditure. Since every additional lagged year shortens the dataset by 1, the longest lag tested was 6 which, in that case, left only 3 data points per county.

In addition to testing various lag lengths, various lag shapes were also imposed on the data. The limited number of data points per county is one reason for imposing these shapes. However, the primary reason for imposing these shapes is the high level of "noise" in the data. It is important to keep in mind that this data was collected from the self-reporting of 159 counties over a nine-year period. It is likely that quite a bit of "personal judgment" was used in classifying some of these capital expenditures. Further, the practice of how and how often the property tax digest is re-assessed probably varies considerably across 159 tax assessors over a nine-year period. Trying to adjust for each county's unique digest history in any given year would be impossible. However, despite these unique patterns, population growth over a period

of time, and the local government response to that growth, is likely a smooth process. Therefore, restricting the lags to a smoothed shape makes intuitive sense. Therefore, each of the four lag lengths was tested using a one of four smooth lag shapes (labeled A, B, C, and D). The lags shapes are as follows:

$$A = \frac{\beta_{\circ}\left[\frac{(I+1)}{2} - \left|i - \frac{(I+1)}{2}\right|\right] x_{t-i}^{j}}{\sum_{1}^{I}\left(\frac{(I+1)}{2} - \left|i - \frac{(I+1)}{2}\right|\right)} \tag{1}$$

$$B = \frac{\beta_{\circ}(i) x_{t-i}^{j}}{\sum_{1}^{I}(i)} \tag{2}$$

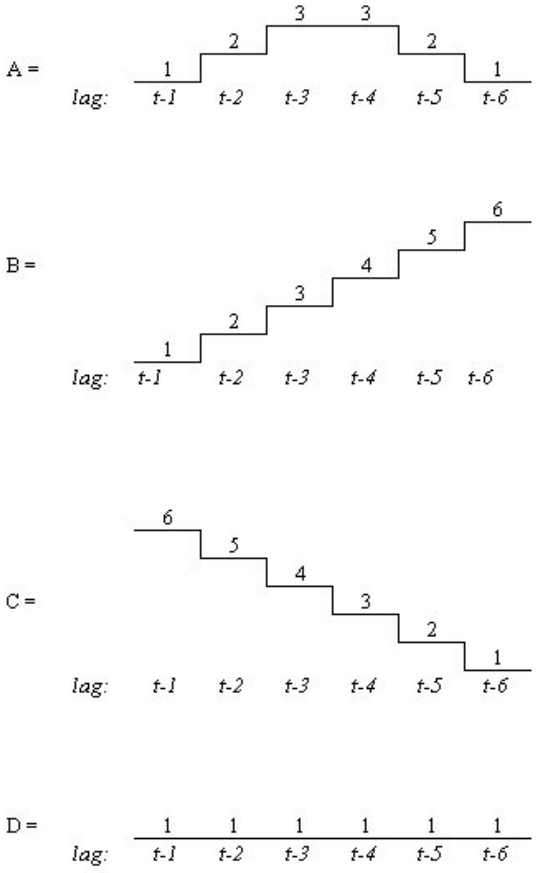
$$C = \frac{\beta_{\circ}(I+1-i) x_{t-i}^{j}}{\sum_{1}^{I}(I+1-i)} \tag{3}$$

$$D = \frac{\beta_{\circ} x_{t-i}^{j}}{I} \tag{4}$$

where "I" is the number of lagged periods; "x" is the inflation-adjusted value of the digest; and "j" represents the property type. Figure 1 presents a graphic representation of these four lag structures and uses the case of 6 lag periods as an example.

Lag shape A puts less weight on the early and longer lags and more weight on the intermediate time periods. For example, using equation 1 above, when I=6 the coefficients on

Figure 1
Lag Shape Example Using Six Lagged Periods



the lagged values would be β/12, 2β/12, 3β/12, 3β/12, 2β/12, and β/12. Similarly, when I=4, the coefficients on the lagged values would be β/6, 2β/6, 2β/6, β/6. Lag shape B puts less weight on the more recent years and progressively more weight on the latter years. For example, when I=6, the coefficients on the lagged values would be β/21, 2β/21, 3β/21, 4β/21, 5β/21, and 6β/21. Conversely, lag shape C puts more weight on the more recent years and less weight on the latter years. Therefore, using equation 3 above, when I=6, the coefficients on the lagged values would be 6β/21, 5β/21, 4β/21, 3β/21, 2β/21, and β/21. Finally, lag shape D is a simple average and

gives the same weight to all lagged values. For example, when I=6 the coefficient on each lagged value would be β/6.

In the case of all four lag shapes, the coefficient is estimated for the composite variable rather than on each lag. Given the imposition of a shape on the lags, the coefficient on the composite variable is equal to the shared coefficient on the individual lag variables. For example, take the standard regression equation:

$$y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \varepsilon \quad (5)$$

and assume that the x_i's are consecutive lags of the independent variable (as in the case of the data presented here). Now assume that for the reasons listed above, a smooth lag shape was imposed on the data such that:

$$\beta_i = \beta_0 \omega_i \quad (6)$$

where ω_i was a weight and β_o is the coefficient on the composite variable. This is exactly what is being done in equations 1, 2, 3 and 4 above. Substituting equation 6 into 5 would yield:

$$y = \alpha + \beta_0 (x_1 \omega_1 + x_2 \omega_2 + x_3 \omega_3) + \varepsilon \quad (7)$$

where only the constant α, and the coefficient on the composite variable β_o need to be estimated. For purposes of establishing a starting point for an impact fee scheme, we are interested in the expected value of a change in y (capital spending) with a change in the value of x (property tax

digest). For the sake of simplicity, assume that the value of the digest *x* increased one time and didn't change again such that $\Delta x_{t-1} = \Delta x_{t-2} = \Delta x_{t-3}$. Then, from equation 5 we would have:

$$\frac{E(\Delta y)}{\Delta x} = \beta_1 + \beta_2 + \beta_3 \tag{8}$$

Substituting in the imposed lag shape in equation 6 results in:

$$\frac{E(\Delta y)}{\Delta x} = \beta_0\left(\sum \omega_i\right) \tag{9}$$

And, since for all four of the lag shapes used here, $\sum\omega_i = 1$, then the expected change in capital spending given a change in the tax digest is equal to β_o, the coefficient on the composite variable.

Expected Results

Using the four lag shapes and the four lag lengths, the following equation was estimated:

$$EXP_{t,i} = \alpha + \beta_{oi} + \beta_1 RC + \beta_2 CC + \varepsilon \tag{10}$$

In this equation, *EXP* represents capital expenditures, β_{oi} is the county fixed-effect, *RC* is the residential composite variable, and *CC* is the commercial composite variable. The composite variables were based on equations (1) through (4) above. For example, using equation (2) for six lagged periods, the composite *RC* would be the sum of the weighed lagged residential digest values using the "B"-shaped lag for I=6. Specifically, in this case, *RC* would be:

$$RC = \frac{\left(r_{t-1} + 2r_{t-2} + 3r_{t-3} + 3r_{t-4} + 2r_{t-5} + r_{t-6}\right)}{12} \tag{11}$$

where *r* is the value of the residential digest. For each county group, 16 residential composite variables and 16 commercial composite variables were calculated (four lag shapes times four lag lengths). For each capital variable, regressions were run using composite combinations of all four lag lengths and all four lag shapes for both residential and commercial/industrial property. The result was 256 regressions (16 residential composites analyzed with 16 commercial composites) for each capital expenditure variable (2) for each county group (5) for a total of 2,560 regressions. The resulting t-scores are presented in Appendix D, tables D-1 through D-10.

The expectation is that for public safety, both residential and commercial property will drive the demand for capital expenditures since both demand public safety services. However, because most of the Super Metro and Atlanta Metro counties are well developed, most of the necessary public safety capital is likely in place. Therefore, there may not be much of a relationship within the nine years tested. For the other three groups that are less developed and growing, the expectation is that during the nine years tested a significant relationship will exist and the marginal contribution to public safety expenditures of both residential and commercial development will be quantified.

For recreation and libraries, the expectation is that only recreation will drive the demand for capital expenditures since commercial development demands little in the way of recreation or library infrastructure. In addition, unlike public safety which local governments must provide, recreation and libraries are more of a luxury good. Therefore, the expectation is that a strong relationship will exist in the three metro groups, but that the less developed non-metro groups

may not offer much in the way of recreation and library services, and therefore, within the nine years tested there may not be much of a statistical relationship.

Public Safety Results

The econometric results for the analysis of public safety expenditures varied widely across the five groups of counties. As expected, for the counties that comprise the Super Metro group, the regression results simply do not suggest much relationship between new development and capital expenditures, at least during these nine years (Table D-1). For all lag lengths and shapes the t-scores for residential property were nearly all positive, but all were insignificant. Similarly, the t-scores for commercial/industrial property were nearly all negative, and again, all insignificant. Again, these results are not surprising since three of the four counties are well developed, and most of the new digest growth is a result of "in-fill" development. Therefore, most of the necessary public safety infrastructure is already in place. Most of the additional infrastructure needed would likely be replacement, and the infrastructure that was needed for additional growth would likely lag by more than 6 years. Interestingly, the best results for residential property were with the longest lag tested — 6 years. This suggests that with more data and longer lags, a relationship might be able to be established for new residential development. However, for commercial property the insignificant negative t-scores do not improve with longer lags, which calls into question any relationship at all.

For the remaining Atlanta Metro counties, the results are slightly different, but not much better (Table D-2). As with the Super Metro counties, the t-scores for both residential and commercial/industrial were all insignificant. However, for both residential and commercial/industrial property, the t-scores steadily improve as the lag length gets shorter with

the strongest results at only three lagged periods. While these are urban and relatively developed counties, it is unlikely that the response to new development occurs within three years. Rather, these results are likely a function of having more data points at fewer lags. To test this theory, the regressions with fewer lags were run with less data so that the number of data points was consistent. For example, as was previously pointed out, nine years of data with six lags leaves only three data points. The data set was truncated one year as the lag was shortened by one year so that each run of six, five, four, and three lag periods had only three data points to consider. The results (Table D-11) support the theory that the improvement in the t-scores was simply a function of having more data. Once the shorter lags were given the same number of data points as the longer lags, the t-scores dropped significantly. Specifically, the average residential and commercial t-scores for the original regressions that used 3 lags for both residential and commercial (highlighted in Table D-2) were 1.85 and 1.52 respectively. Once the dataset was truncated such that those regressions only had three data points, those t-scores dropped to 0.53 and -0.38 respectively (highlighted in Table D-11).

For the counties in the Smaller Metro group, the regression results clearly suggest a strong relationship between residential development and the demand for public safety infrastructure (Table D-3). The t-scores for residential development are very significant when the lag was six periods, and the strongest relationship by far was with lag shape B. These results were expected and are intuitively appealing for two reasons. First, these are metro counties with less than 1 million people in their MSA, and an average inflation-adjusted annual growth rate of 3.1 percent over the period. This suggests that these counties are likely to have the growing tax base to meet the demands of new development. Second, lag shape B is the one that puts less weight on recent history, and more weight on distant history. Since it takes time for local

government to respond to growth, this lag shapes fits the intuitive model of a smooth delayed response.

These results are also encouraging since these are the very counties that could benefit most from the implementation of impact fees. The coefficient on the residential composite variable using 6 lags and the "B" shape ranged from 0.0453 to 0.0498 with an average of 0.0471 when paired with the 16 commercial composite variables. Table 5 presents the results of just one of these regressions — residential 6-lag "B" shape composite variable with the commercial 6-lag "B" shape composite variable.

Table 5
Fixed-Effect Model Coefficient Estimates

Independent Variable	Beta Coefficient	Standard Error	t-score
Intercept	-14.2438	4.2605	-3.34
Residential composite – 6 lag "B" shape	.0453	.0114	3.97
Commercial composite – 6 lag "B" shape	-.0226	.0233	-0.97

R-square: .31

Since the data are in the millions of dollars, the coefficient on the residential composite variable of .0453 multiplied times $1,000,000 would be $45,300. Therefore, using this coefficient, for every $1 million added to the residential digest, impact fees in the amount of $45,300 would need to be collected to cover the cost of the needed public safety capital. To get to a per house impact fee that would cover the cost of capital, assume that the average new home price in these counties is $200,000. The tax digest is assessed at 40 percent of Fair Market Value therefore, a $200,000 house adds $80,000 to the tax digest. Since $80,000 is 8 percent of $1,000,000, then 8 percent of the $45,300 needed per $1,000,000 would be applied as the cost of public safety infrastructure that is necessary due to an average new home. In this case, that

would equate to just over $3,600. It is important to keep in mind that this would be only the starting point for an impact fee scheme. Of course the fee would have to be reduced to offset the contribution of other capital funding including a dedicated sales tax (like Georgia's Special Purpose Local Option Sales Tax or SPLOST) or any other dedicated capital funding source.

As with the two previous regions, the relationship with commercial/industrial development is once again statistically insignificant. Despite lag length or lag structure, the t-scores range from -1.51 to 1.70 for all 256 regressions done for these counties. Once again, the relationship between commercial/industrial development and the need for new public safety infrastructure is called into question.

For the Non-Metro Urban counties (those in Regions 4 through 7), the regression results are not as strong (Table D-4). While residential t-scores do improve as the number of lags increases, even at six lags, as with the Super Metro counties, the results are still insignificant. However, as with the previous group of counties, these results are also intuitively appealing. These counties are considered rural and have only a small urban population. It is not difficult to imagine that it takes longer than six years for the capital needs of the new development to be met. However, at six years, while still insignificant, the t-scores improve drastically, and once again are highest for the B lag shape which puts less weight on recent history. This once again suggests that the relationship exists, but a longer lag structure (e.g., more data) is needed. Though insignificant, the coefficients on the six-year, B-shaped lag range from 0.0164 to 0.0235 with an average of 0.0209. Therefore, for every $1 million added to the residential digest, impact fees in the amount of $20,900 need to be collected to cover the cost of the needed public safety capital. Again, this means that if the average new home value in these counties is $100,000 ($40,000 added to the tax digest) an impact fee would need to start at $836 before any

other funding was taken into consideration. Similarly, if the average new home was $150,000, an impact fee of $1,234 would be needed to cover the cost of public safety infrastructure. Certainly a reasonable amount and one that is comparable to typical impact fee assessments. Not surprisingly, the relationship between commercial/industrial development and public safety infrastructure is once again not supported.

The final grouping of counties is made up of the 26 counties in Georgia that are considered completely rural. Interestingly, as with the Smaller Metro counties in groups 2 and 3, there is a strong, statistically significant relationship between residential development and public safety infrastructure (Table D-5). In fact, the strongest relationship (e.g., the highest average t-scores) occurs with six lags. Also, as has been the pattern, the strongest lag shape across all lags is "B." Of all the results within public safety, this one is the most surprising. These rural counties have an average inflation-adjusted annual growth rate of 4.0 percent — the highest among the non-metro counties. It may not be at first intuitive that these local governments would respond this quickly to the demands of new residential development. However, the results for both the 5- and 6-period lag show a statistically significant relationship between expenditures and residential development. The coefficients on the six-year, B-shaped lag range from 0.0276 to 0.0483 with an average of 0.0358. Therefore, for every $1 million added to the residential digest, impact fees in the amount of $35,800 need to be collected to cover the cost of the needed public safety capital in these rural counties. Given an average new home price of $50,000, an impact fee of $716 would be needed to cover the increased cost of public safety infrastructure. If the average new home price was $100,000, the impact fee would need to start at $1,432 before any other funding was taken into consideration. This is slightly higher than is the case for the non-metro urban counties. However, given that the population tends to be less dense in these

rural areas, it isn't hard to imagine that the cost of public safety infrastructure would be higher than an area with a population that is closer together. In fact, in inflation adjusted terms, the average per capita public safety equipment cost in the less dense rural counties for all nine years is 25 percent more than the per capita cost in the Non-Metro Urban counties ($9.06 vs. $7.25). Not surprisingly, the relationship between commercial/industrial development and public safety infrastructure holds to the pattern displayed in all the other regions — no significant relationship at any lag length.

The results for public safety across all types of counties are encouraging. They suggest that for public safety this ex post statistical analysis of actual expenditures would be a valid method and basis for an impact fee scheme that would cover the cost of new infrastructure. For the most part, the results held to the expected results and show statistically significant relationships between residential growth and public safety infrastructure, and the coefficients present levels that are reasonable for impact fees in practice. The only non-expected result is the lack of a statistically significant relationship between capital expenditures and commercial development.[2]

Recreation & Library Results

As with public safety, the econometric results for the analysis of recreation and library expenditures varied widely across the five categories of counties. For counties in the Super Metro group, the regression results are completely mixed (Table D-6). For the most part, the

[2] Given the fact that the composite variables used here share a common time trend and since it is very possible that commercial/industrial development occurs at the same time as residential development, the data was tested for the existence of correlation between the composite variables. The average correlation between the composite six-year B-shaped lagged residential variable (the one that usually demonstrated good results) and all the composite commercial/industrial variables ranged from a low of -.46 for the smaller metro group to a high of -.62 for the Atlanta Metro group. These results do not indicate a high correlation between the two composite variables.

results for residential development are statistically significant, but vary widely within lag length between lag shapes, and the results don't show a trend with respect to the length of the lags. Also, with respect to commercial/industrial development, most of the results are statistically significant, but with *negative* coefficients. Certainly a case can be made that commercial/industrial development should have little impact on the demand for recreation and library infrastructure, but in that case, statistically insignificant results for the commercial/industrial property would be expected. The significant but negative results here simply cannot be explained, and combined with the near randomness of the residential results — the methodology simply fails with respect to this region.

However, as expected, the results for the remaining counties in the Atlanta Metro group make much more sense and have intuitive appeal (Table D-7). All of the results for residential development were statistically significant, and as the lag got longer, the results got better. In addition, as was often the case with public safety, in every lag length, lag shape "B" had the best results. The coefficients on the six-year, B-shaped lag range from 0.0329 to 0.0359 with an average of 0.0345. Therefore, for every $1 million added to the residential digest, impact fees in the amount of $34,500 need to be collected to cover the cost of the recreation and library infrastructure in these metro Atlanta counties. If the average new home price in the Atlanta Metro group was $250,000, an impact fee would need to start at $3,450 before any other funding was taken into consideration. Again, this result is intuitively appealing given that the residents in these counties would tend to demand a higher level of amenities like parks and libraries than would residents in other groups. On average, the residential digest for counties in the Atlanta Metro group grew at an inflation-adjusted annual rate of 6.6 percent over the period, (by far the fastest of all the regions) and this growth clearly drove the demand for recreation and library

infrastructure. Once again, the results for commercial/industrial development were statistically insignificant, and improved only slightly with the longer lags.

Unlike the results for public safety, the regression results for the counties in the Smaller Metro group did not show a strong relationship between residential development and the demand for recreation and library infrastructure (Table D-8). To the contrary, the results for both residential development and commercial/industrial development were statistically insignificant and improved very little as the lag length increased.

The counties in the Non-Metro Urban group showed statistically significant results only for residential development, and only for the shortest of lag lengths (Table D-9). Unfortunately, as was this case with public safety for the Atlanta Metro group, these results are due to the fact that more data points became available as the lag length decreased rather than an identification of the true lag length. As was done previously, regressions were run allowing each lag length to have the same number of data points (Table D-12). Once again, the residential t-scores dropped dramatically for the shorter lags once they no longer had the advantage of more data. Specifically, the average t-score for the shortest lags (highlighted in Table D-9) was 2.35 in the original regressions. Once the data was truncated, the average score for those short lags dropped to -0.81 (highlighted in Table D-12) Therefore, there doesn't appear to be a statistical relationship between new development and recreation and library expenditure for these non-metro counties with an urban population of at least 2,500.

Similarly, the completely rural counties in groups 8 and 9 also showed statistically insignificant results for both residential development and commercial/industrial development across all lag lengths and shapes (Table D-10).

Clearly the results of this methodology for recreation and libraries are not as good as was the case for public safety. However, this wasn't unexpected. Public safety is an area in which local governments must respond to the needs of new development. However, only the large, urban, rapidly-developing counties have the ability to provide the amenities of recreation and libraries demanded by their residents. It isn't at all surprising that only in these counties do we see the clear relationship between new development and capital expenditures in this category. Further, it is these counties that are most likely to use impact fees to cover the costs of new recreation infrastructure.

CHAPTER 5

CONCLUSIONS

The results of this analysis point to three important conclusions. The first, and most important is that the unique ex-post economic analysis presented here appears to be a valid procedure for establishing the relationship between new development and the cost of capital needed to support that development — the goal that was put forth in Chapter 1. While not all the regressions showed statistically significant results, in many cases, the results indicated that longer lags (e.g., more data) would support the methodology. Further, this relationship could form the basis for an impact fee program that can pass the rational nexus test — at least in Georgia. In a previous footnote, it was pointed out that most courts and legislatures have expanded the rational nexus test to require that impact fees must be spent within a zone or district where a development is located. The methodology presented here establishes the relationship between new development county-wide and capital expenditures county-wide, and as such, would not pass the rational nexus criterion for most jurisdictions. However, in 2002, the Georgia Court of Appeals upheld the Cherokee County impact fee for recreation and libraries which defined the service area as countywide (*Cherokee County v. Greater Atlanta Homebuilders Association*, 2002). Therefore, not only does this methodology use Georgia data, but its application, from a legal perspective, may be uniquely applicable to Georgia.

The second conclusion, and a not surprising one, is that the response to development differs widely across types of counties. While this may be somewhat obvious, when applying this methodology, this is an important factor to consider. If this methodology is to form the basis

for an impact fee program, both the length of time between development and the need for the infrastructure as well as the level of infrastructure needed to support that development are important factors to consider. In fact, these factors must be considered since most statutes require that impact fees collected be spent within a reasonable amount of time and be part of a comprehensive plan for service improvements. The time-frame and service level for a particular type of county is important to know prior to development of the program.

A final and more interesting conclusion is that a relationship between commercial and industrial development and the cost of the three types of capital examined here is not supported by the data. In most cases, it appears that the driver for infrastructure is residential development. With respect to recreation and libraries that is intuitive and a local government would be hard pressed to justify charging commercial/industrial development an impact fee for recreation and library infrastructure. However, these results applied to public safety infrastructure are far less intuitive. Anecdotal evidence suggests that commercial property — retail in particular — is a substantial consumer of public safety services. What then is the rationale behind these results? The answer may lie in the order of development. Typically, commercial development follows residential development, and much of it services the residential community. Ultimately then, it is the residential development that is driving the need for more infrastructure. Another possibility may lie within the data itself. A statistical analysis that relies on lags of both of these types of development over the same short period of time may not have enough data to separate the affects of the commercial development that supports the residential versus the commercial development that is more basic in nature. In either case, the statistical analysis presented here shows that residential development is the major factor behind the need for these three types of infrastructure.

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APPENDIX A

REPORT OF LOCAL GOVERNMENT FINANCES

FORM F-65 (GA-1A)
(1-22-2004)
STATE OF GEORGIA
DEPARTMENT OF COMMUNITY AFFAIRS

2004 REPORT OF LOCAL GOVERNMENT FINANCES
GEORGIA COUNTIES

RETURN TO Department of Community Affairs
P.O. Box 95068
Atlanta, GA 30347-0068

(Please correct any error in name, address, and ZIP Code)

IMPORTANT -- Please provide the data for your fiscal year that ended between July 1, 2003 and June 30, 2004. In the space to the right, mark an (X) in the appropriate box to indicate the ending month of your government's fiscal year (12 month accounting period) and report data for this period only. Use the fiscal year called for by the instructions even though data from a more recent year may be available.

2003	2004
☐ July	☐ January
☐ August	☐ February
☐ September	☐ March
☐ October	☐ April
☐ November	☐ May
☐ December	☐ June

GENERAL INSTRUCTIONS

- Do not include entries in shaded areas
- Answer ONLY questions that apply to your government
- Report on same basis as accounting system
- Use your audit, if available
- Whole dollars – No Cents
- For help contact Charles Dunlap on 404-679-4996

Part I — TAX REVENUES — ALL FUNDS	Fiscal year collections *Omit cents*	
Section A — PROPERTY TAXES		
Real and personal property taxes	$	101
FIFA, penalties, interest, cost		102
Public utilities taxes		103
Motor vehicle taxes		104
Mobile home taxes		105
Intangible taxes (regular and recording)		106
Railroad equipment tax		107
Tax collection fees retained by tax collector for your government		108
Total Section A – *Sum of lines 101–108*	$	109
Section B — SALES TAXES		
Local option sales tax	$	110
MARTA tax (DeKalb and Fulton counties ONLY)		111
Special purpose sales tax		112
Total Section B – *Sum of lines 110–112*	$	113
Section C — EXCISE AND SPECIAL USE TAXES		
Alcoholic beverages taxes — beer, wine, liquor and mixed drinks – ***Attach Schedule***	$	114
Insurance premiums tax		115
Hotel/motel tax		116
Franchise payments taxes		117
Other excise and special use taxes – ***Attach list***		118
Total Section C – *Sum of lines 114–118*	$	119
Section D — LICENSES, PERMITS, AND FEES		
Business licenses and occupational taxes		120
Alcoholic beverage licenses	$	121
Building permits		122
Other licenses, permits and fees – ***Attach list***		123
Total Section D – *Sum of lines 120–123*	$	124
TOTAL PART I – *Sum of lines 109 + 113 + 119 + 124*	$	125

PLEASE RETURN TO DCA BY JUNE 30, 2004

A	B	C	D	E	F	G	H	I	J	K	L

Part II — INTERGOVERNMENTAL REVENUE — ALL FUNDS

Start up grants for utility systems should be reported here

PURPOSE FOR WHICH RECEIVED	From State (a)	From other local governments (b) Govt ID No.	From other local governments (b) Amount	From Federal government (directly) (c)
Payment in lieu of taxes	$ 201	202	$ 203	$ 204
General public purpose grants	205	206	207	208
Capital outlay grants	209	210	211	212
Fuel oil and road mileage	213	214	215	216
Road, street, and bridge funds (DOT Contracts)	217	218	219	220
Water/wastewater grants	221	222	223	224
Solid waste grants	225	226	227	228
Revenues of county board of health	229	230	231	232
Crime and corrections grants	233	234	235	236
Community Development Block Grants	237	238	239	240
Public welfare grants	241	242	243	244
Real estate transfer tax	245	246	247	248
Other intergovernmental revenue – ***Attach list***	249	250	251	252
TOTAL PART II	253 $	254	255 $	256 $
General revenue sharing	257	258	259	260
Physical health and mental health grants*	$ 261	262	263	264

**Data provided to DCA by Department of Human Resources, please do not make an entry*

Part III — SERVICE CHARGES AND OTHER REVENUES – ALL FUNDS

	Fiscal year collections *Omit cents*
Section A — SERVICE CHARGES	
Parking facilities and meters	$ 301
Parks and recreation charges	302
Ambulance charges	303
Hospital charges	304
Garbage and trash collection charges	305
Landfill fees	306
Special assessments	307
Fire service subscription fees	308
Other service charges – ***Attach list***	309
Total Section A – *Sum of lines 301–309*	310 $
Section B — OTHER REVENUES	
Interest earnings on investments	$ 311
Fines, forfeits and court fees	312
Fee collections of county officers	313
Receipts from sale of materials and surplus equipment	314
Receipts from sale of real property (land and buildings)	315
Rents and royalties	316
Cemetery fees	317
All additional revenues – ***Attach list***	318
Total Section B - *Sum of lines 311–318*	319 $

Part IV — REVENUES FROM PUBLIC UTILITY SYSTEMS AND OTHER ENTERPRISE FUNDS

Please consult the instructions on dependent agencies before completing part IV.
If an entry is made in part VI under any enterprise fund category, a corresponding entry should be made for that fund under the revenue category in part IV.
If government has more than one other enterprise fund (column (f)), please attach a schedule.

SYSTEM REVENUES	Water and sewer system (a)	Electric supply system (b)	Gas supply system (c)	Airport (d)	Solid waste system (e)	Other enterprise funds ***Specify*** (f)
Operating revenue	$ 350	$ 353	$ 356	$ 359	$ 362	$ 365
Other revenue	351	354	357	360	363	366
TOTAL PART IV	352 $	355 $	358 $	361 $	364 $	367 $

NOTES

Part V — EXPENDITURES FROM GOVERNMENTAL FUNDS (DO NOT INCLUDE ENTERPRISE FUNDS)

Report expenditures from ALL GOVERNMENTAL FUNDS EXCEPT:
1. Principal and interest on debt – *Report in Part X*
2. Enterprise funds or Public Utility Systems, if reported in part VI
3. Inter-fund transfers

Report expenditures from Federal revenue sharing funds in columns (d) and (e).
Expenditures reported in columns (d) and (e) should also be reported in columns (a), (b), and (c), as well.
Expenditures from revenue sharing funds for public utility systems should also be reported in part VI.
Expenditures should include all salaries and benefits.

FUNCTION OR PURPOSE OF EXPENDITURE	Current operations (a)	Purchase of equipment, land, and structures (b)	Construction (c)	Actual revenue sharing expenditures	
				Current (d)	Capital (e)
General administration and support services	401 $	402 $	403 $	$	$
Financial administration	404	405	406		
Tax commissioner	407	408	409		
Tax assessor/appraiser	410	411	412		
General government buildings	413	414	415		
Building inspection and regulation	416	417	418		
Superior court	419	420	421		
State court	422	423	424		
Juvenile and magistrate court	425	426	427		
Probate court	428	429	430		
Clerk of courts	431	432	433		
Municipal court	434	435	436		
Sheriff's department	437	438	439		
Police department	440	441	442		
Correctional institute	443	444	445		
Jail	446	447	448		
Fire department	449	450	451		
Ambulance service	452	453	454		
Highways and streets – *Do not include drainage*	455	456	457		
Parking facilities and meters	458	459	460		
County or municipal hospital	461	462	463		
Payments to other hospitals	464	465	466		
Public health	467	468	469		
Public welfare and social services	470	471	472		
Parks and recreation	473	474	475		
Education (expend. by gen. govt.)	476	477	478		
Community development	479	480	481		
Natural resources	482	483	484		
Garbage and trash collection	485	486	487		
Garbage and trash disposal (landfill, etc.)	488	489	490		
Libraries	491	492	493		
General insurance	494	495	496		
Drainage	497	498	499		
Public utility systems	500	501	502		
Legal fees	503	504	505		
Other expenditures – ***Attach list***	506	507	508		
TOTAL PART V	509 $	510 $	511 $		
Physical and mental health grants	512 $	513 $	514 $		

Part VI — EXPENDITURES FOR PUBLIC UTILITY SYSTEMS AND OTHER ENTERPRISE FUNDS

Please consult the instructions on dependent agencies before completing part VI.
If an entry is made in part VI under any enterprise fund category, a corresponding entry should be made for that fund under the revenue category in part IV.
*If government has more than one other enterprise fund (column (f)), **Please attach a schedule.***

SYSTEM EXPENDITURES	Water and sewer system (a)	Electrical supply system (b)	Gas supply system (c)	Airport (d)	Solid waste system (e)	Other enterprise funds ***Attach list*** (f)
Current operations	550 $	555 $	560 $	565 $	570 $	575 $
Purchase of equipment, land, and structures	551	556	561	566	571	576
Construction	552	557	562	567	572	577
Interest expenditures	553	558	563	568	573	578
TOTAL PART VI	554 $	559 $	564 $	569 $	574 $	579 $

Part VII — PERSONNEL EXPENDITURES

Reported salaries and wages and employee benefits should also be included under part V, columns (a) and (c).
Report gross salaries and wages before withholdings are deducted – Use W-2 totals if appropriate.

	Expenditures *Omit cents*
Employee benefits	$ 580
Salaries and wages for current operations	581
Salaries and wages for construction	582
TOTAL PART VII – *Sum of lines 580 + 581 + 582*	583 $

Part VIII — INTERGOVERNMENTAL PERSONNEL EXPENDITURES

Report salaries and wages and employee benefits mentioned above that are paid to other governments for shared or joint employees.
Report gross salaries and wages before withholdings are deducted.

	Government ID number	Expenditures *Omit cents*
Employee benefits	584	$ 585
Salaries and wages for current operations	586	587
Salaries and wages for construction	588	589
TOTAL PART VIII		590 $

Part IX — INTERGOVERNMENTAL EXPENDITURES

Include amounts paid on a reimbursement or cost-sharing basis.
These expenditures should also be included in part V.

FUNCTION OR PURPOSE OF EXPENDITURE	AMOUNT PAID TO: State (a)	Other local governments (b) Govt ID No.	Other local governments (b) Amount	Authorities or special districts (c)
Parks and recreation	$ 700	701	$ 702	$ 703
Jails	704	705	706	707
Fire protection	708	709	710	711
Police protection	712	713	714	715
Public health	716	717	718	719
Hospitals	720	721	722	723
Libraries	724	725	726	727
Public welfare	728	729	730	731
Garbage and trash collection	732	733	734	735
Garbage and trash disposal	736	737	738	739
Highways, streets, and drainage	740	741	742	743
Water/sewer system	744	745	746	747
Electric supply system	748	749	750	751
Gas supply system	752	753	754	755
Public transit	756	757	758	759
Airport	760	761	762	763
Other purposes – *Attach list*	764	765	766	767
TOTAL PART IX	768 $	769	770 $	771 $

Part X — DEBT OUTSTANDING, ISSUED, RETIRED DURING FISCAL YEAR

Section A -- REVENUE BOND DEBT (INCLUDING EARNINGS OF AN ENTERPRISE FUND)

PURPOSE OF DEBT	Dollar amount outstanding at beginning of fiscal year (a)	During fiscal year: Dollar amount issued (b)	During fiscal year: Dollar amount retired (c)	Dollar amount outstanding at end of fiscal year (d)	Dollar amount of interest paid during fiscal year (e)
Water/sewer	$ 801	$ 802	$ 803	$ 804	$ 805
Gas utility system	806	807	808	809	810
Electric utility system	811	812	813	814	815
Industrial revenue bonds	816	817	818	819	820
Public transit system	821	822	823	824	825
Airport	826	827	828	829	830
Parks and recreation facilities	831	832	833	834	835
Solid waste system	836	837	838	839	840
All other* *Attach itemized list*	841	842	843	844	845
Total Section A	846 $	847	848 $	849 $	850 $

**All other includes bond handling costs; please attach itemized list.*

PART X CONTINUED ON PAGE 5

Part X — DEBT OUTSTANDING, ISSUED, RETIRED DURING FISCAL YEAR — Continued

Section B — GENERAL OBLIGATION BOND DEBT

PURPOSE OF BONDS	Dollar amount outstanding at beginning of fiscal year (a)	During fiscal year		Dollar amount outstanding at end of fiscal year (d)	Dollar amount of interest paid during fiscal year (e)
		Dollar amount issued (b)	Dollar amount retired (c)		
Water/sewer	$ 900	$ 901	$ 902	$ 903	$ 904
Education (issued by general government)	905	906	907	908	909
Law enforcement and corrections	910	911	912	913	914
Jails	915	916	917	918	919
Fire protection	920	921	922	923	924
Public buildings	925	926	927	928	929
Highways, streets and drainage	930	931	932	933	934
Parks and recreation facilities	935	936	937	938	939
Multi-purpose	940	941	942	943	944
Solid waste system	945	946	947	948	949
All other* *Attach itemized list*	950	951	952	953	954
Total Section B	955 $	956 $	957 $	958 $	959 $

Section C — OTHER LONG-TERM DEBT (GEFA, EPA, EPD, FHA, FmHA, SRF, etc.)

PURPOSE OF DEBT	Dollar amount outstanding at beginning of fiscal year (a)	During fiscal year		Dollar amount outstanding at end of fiscal year (d)	Dollar amount of interest paid during fiscal year (e)
		Dollar amount issued (b)	Dollar amount retired (c)		
Water/sewer	$ 1000	$ 1001	$ 1002	$ 1003	$ 1004
Education (issued by general government)	1005	1006	1007	1008	1009
Law enforcement and corrections	1010	1011	1012	1013	1014
Jails	1015	1016	1017	1018	1019
Fire protection	1020	1021	1022	1023	1024
Public buildings	1025	1026	1027	1028	1029
Highways, streets and drainage	1030	1031	1032	1033	1034
Parks and recreation facilities	1035	1036	1037	1038	1039
Multi-purpose	1040	1041	1042	1043	1044
Solid waste system	1045	1046	1047	1048	1049
All other* *Attach itemized list*	1050	1051	1052	1053	1054
Total Section C	1055 $	1056 $	1057 $	1058 $	1059 $

Section D — LEASE PURCHASE (INCLUDING ACCG and GMA)

PURPOSE OF DEBT	Dollar amount outstanding at beginning of fiscal year (a)	During fiscal year		Dollar amount outstanding at end of fiscal year (d)	Dollar amount of interest paid during fiscal year (e)
		Dollar amount issued (b)	Dollar amount retired (c)		
Water/sewer	$ 1100	$ 1101	$ 1102	$ 1103	$ 1104
Education (issued by general government)	1105	1106	1107	1108	1109
Law enforcement and corrections	1110	1111	1112	1113	1114
Jails	1115	1116	1117	1118	1119
Fire protection	1120	1121	1122	1123	1124
Public buildings	1125	1126	1127	1128	1129
Highways, streets and drainage	1130	1131	1132	1133	1134
Parks and recreation facilities	1135	1136	1137	1138	1139
Multi-purpose	1140	1141	1142	1143	1144
Solid waste system	1145	1146	1147	1148	1149
All other* *Attach itemized list*	1150	1151	1152	1153	1154
Total Section D	1155 $	1156 $	1157 $	1158 $	1159 $

**All other includes bond handling costs; please attach itemized list.*

PART X CONTINUED ON PAGE 6

Part X — DEBT OUTSTANDING, ISSUED, RETIRED DURING FISCAL YEAR — Continued

Section E — SHORT-TERM DEBT (LESS THAN 1 YEAR)

	Amount *Omit cents*
Amount outstanding at beginning of fiscal year	$ 1200
Amount issued during fiscal year	1201
Amount retired during fiscal year	1202
Amount outstanding at end of fiscal year	1203
Interest paid on short-term debt this fiscal year	1204

Part XI — CASH AND INVESTMENT ASSETS AT THE END OF FISCAL YEAR

	Held in sinking funds (a)	Held in bond funds (b)	Held in general and all other funds (c)
1. Amount held at end of previous fiscal year	1210 $	1211 $	1212 $
2. Cash and deposits – cash on hand and demand deposits, CDs and time or savings deposits	1213 $	1214 $	1215 $
3. Federal securities – obligations of U.S. Treasury, including short-term notes	1216	1217	1218
4. Federal agency securities	1219	1220	1221
5. State and local government agencies	1222	1223	1224
6. Other securities	1225	1226	1227
TOTAL PART XI – *Sum of lines 2–6*	1228 $	1229 $	1230 $

Part XII — AUTHORITIES, BOARDS, COMMISSIONS, AND SPECIAL DISTRICTS

Please list below the names of all authorities, boards, commissions, and special districts whose finances are included in this report.

WHAT HAPPENS TO THIS INFORMATION?

Each year the Georgia Department of Community Affairs collects this information from you. At the Federal level the Census Bureau uses it to prepare national reports on local government finance.

- To prepare an annual *Highlights* of Local Government Finance in Georgia, as required by Georgia law;
- To provide your local government with data, both your own and that of other communities, to help you analyze your finances;
- To prepare annual *Municipal and County Fiscal Planning Guides*, available free to all local governments on request;
- To prepare information reports on key issues in local finance; and
- To prepare a common data base for the use of local and state officials.

Your cooperation is very much appreciated. Please contact DCA's Office of Research and Communications for further information about the services and publications listed above.

CHECKLIST

- Have you completed all entries that apply to your government?
- Have you attached itemized lists where appropriate?
- Have you marked the ending month of your government's fiscal year?
- Have you left all shaded areas blank?

Part XIII — CERTIFICATION — This is to certify that the data contained in this report are accurate to the best of my knowledge.

a. Name of government	Name of chief elected official – *Print or type (Name, official title)*		
b. Signature of chief elected official		Date	
c. Telephone number	Area code	Number	Extension
d. Person to contact – *Print or type (Name and title)*		**e.** Office hours	
f. Telephone number	Area code	Number	Extension

APPENDIX B

SAMPLE TAX DIGEST CONSOLIDATED SUMMARY

GEORGIA DEPARTMENT OF REVENUE Property Tax Division - County Digest Section	2002 TAX DIGEST CONSOLIDATED SUMMARY March 2, 2005

County: GWINNETT County #: 067 Tax District: STATE

Dist #: 01 Assessment %: 40 Tot Parcels: 253,288

RESIDENTIAL

Code	Count	Acres	40% Value
R1	177,727		8,624,464,360
R3	193,796	101,019	2,790,147,220
R4	3,268	28,369	205,446,730
R5	342	20,618	151,354,950
R6	22,646		37,509,540
R9	6		4,800
RA	81		1,820,150
RB	16,013		24,693,950
RF			
RI			
RZ			

RESIDENTIAL TRANSITIONAL

Code	Count	Acres	40% Value
T1	5		52,400
T3	5	6	245,120
T4			

HISTORICAL

Code	Count	Acres	40% Value
H1	2		43,440
H3	2	11	54,640

AGRICULTURAL

Code	Count	Acres	40% Value
A1	779		37,753,390
A3	6	17	75,520
A4	15	249	1,591,040
A5	97	5,586	36,389,800
A6	231		786,410
A9			
AA			
AB	1		700
AF			
AI			
AZ			

PREFERENTIAL

Code	Count	Acres	40% Value
P3			
P4			
P5			
P6			

UTILITY

Code	Count	Acres	40% Value
U1	4		3,022
U2	161	6,382	359,174,099
U3	41	54	211,424
U4	11	86	152,904
U5	1	96	772,820
U9			
UA			
UB			
UF			
UZ			

EXEMPT PROPERTY

Code	Count	40% Value
E0	1	774,200
E1	941	332,125,600
E2	594	225,977,680
E3	87	13,439,080
E4	74	3,540,800
E5	22	44,568,360
E6	162	373,419,800
E7	1	1,338,720
E8		
E9	11	625,200
	---	---
TOTAL	1,893	995,809,440

HOMESTEAD AND PROPERTY EXEMPTIONS

Code	Count	M&O Amount	Bond Amount
S1	134,610	269,220,000	
S2			
S3	19	38,000	
S4	1	4,000	
S5	151	6,091,150	
S6			
S7			
S8			
S9			
SF	863	870,614,970	870,614,970
SA			
SP	5,610	679,800	679,800
SH	2	40,240	40,240

P9			
CONSERVATION USE			
Code	Count	Acres	40% Value
V3	72	228	1,848,800
V4	678	8,299	58,521,040
V5	286	17,048	105,521,090
V6	349		1,443,310
ENVIRONMENTALLY SENSITIVE			
Code	Count	Acres	40% Value
W3			
W4			
W5			
COMMERCIAL			
Code	Count	Acres	40% Value
C1	6,576		2,384,389,560
C3	7,515	7,922	663,639,670
C4	967	10,439	560,367,070
C5	193	8,505	313,950,600
C9	152		9,255,960
CA	288		21,985,460
CB	31		51,790
CF	18,063		1,237,527,330
CI	10,731		752,275,290
CP	735		710,298,250
CZ			
INDUSTRIAL			
Code	Count	Acres	40% Value
I1	1,923		1,161,494,320
I3	1,948	3,666	132,362,060
I4	771	7,679	240,630,290
I5	97	6,476	102,259,610
I9	67		4,274,280
IA			
IB			
IF	146		268,600,600
II	129		44,912,560
IP	128		160,316,720
IZ			

ST	5	175,400	175,400
SV	1,036	159,641,230	159,641,230
SW			
L1	301	602,000	
L2	1	2,000	
L3	382	764,000	
L4	193	386,000	
L5	11,410	22,820,000	
L6			
L7			
L8			
L9			
	---	---	---
TOTAL	154,584	1,331,078,790	1,031,151,640

SUMMARY

Code	Count	Acres	40% Value
Residential	413,879	150,006	11,835,441,700
Residential Transitional	10	6	297,520
Historical	4	11	98,080
Agricultural	1,129	5,852	76,596,860
Preferential	0	0	0
Conservation Use	1,385	25,575	167,334,240
Environmentally Sensitive	0	0	0
Commercial	45,251	26,866	6,653,740,980
Industrial	5,209	17,821	2,114,850,440
Utility	218	6,618	360,314,269
Motor Vehicle	461,067		1,918,092,310
Mobile Home	4,992		20,540,360
Timber 100%	6		160,950
Heavy Equipment	196		1,153,390
Gross Digest	933,150	232,755	23,148,621,099
Exemptions Bond			1,031,151,640
Net Bond Digest			22,117,469,459
Gross Digest			23,148,621,099
Exemptions M&O			1,331,078,790
Net M&O Digest			21,817,542,309

TAX LEVIED

Type	40% Value	Millage	TAX
M&O	21,817,542,309	.250	$5,454,385.58
BOND	22,117,469,459	.000	$.00

APPENDIX C

STATA DO FILES

```
************************************************
**   DO FILE FOR GENERATING CAPITAL
**   VARIABLES AND LAGS
************************************************

* Capital variables
*********************
gen gencap02=geneq02+gencon02
gen pubcap02=pubweq02+pubcon02
gen crtcap02=crteq02+crtcon02
gen pscap02=pseq02+pscon02
gen hltcap02=hlteq02+hltcon02
gen swcap02=sweq02+swcon02
gen reclcap02=recleq02+reclcon02
gen ffcap02=ffeq02+ffcon02
gen allcap02=gencap+pubcap+crtcap+pscap+hltcap+swcap+reclcap+ffcap
gen feecap02=pscap+reclcap+pubcap

* Scale the variables
***********************
gen resimpvm = resimpv02/1000000
gen cniimpvm = cniimpv02/1000000
gen totimpvm = totimpv02/1000000
gen gencapm = gencap02/1000000
gen pubcapm = pubcap02/1000000
gen crtcapm = crtcap02/1000000
gen pscapm = pscap02/1000000
gen hltcapm = hltcap02/1000000
gen swcapm = swcap02/1000000
gen reclcapm = reclcap02/1000000
gen ffcapm = ffcap02/1000000
gen allcapm = allcap02/1000000
gen feecapm = feecap02/1000000

* Residential lags
********************
gen resimpvmL1 = resimpvm[_n-1]
replace resimpvmL1=. if year==1994
gen resimpvmL2= resimpvmL1[_n-1]
replace resimpvmL2=. if year==1994
gen resimpvmL3= resimpvmL2[_n-1]
replace resimpvmL3=. if year==1994
gen resimpvmL4= resimpvmL3[_n-1]
replace resimpvmL4=. if year==1994
gen resimpvmL5= resimpvmL4[_n-1]
replace resimpvmL5=. if year==1994
gen resimpvmL6= resimpvmL5[_n-1]
replace resimpvmL6=. if year==1994
```

```
* Commercial lags
**********************
gen cniimpvmL1 = cniimpvm[_n-1]
replace cniimpvmL1=. if year==1994
gen cniimpvmL2= cniimpvmL1[_n-1]
replace cniimpvmL2=. if year==1994
gen cniimpvmL3= cniimpvmL2[_n-1]
replace cniimpvmL3=. if year==1994
gen cniimpvmL4= cniimpvmL3[_n-1]
replace cniimpvmL4=. if year==1994
gen cniimpvmL5= cniimpvmL4[_n-1]
replace cniimpvmL5=. if year==1994
gen cniimpvmL6= cniimpvmL5[_n-1]
replace cniimpvmL6=. if year==1994


* Total lags
**********************
gen totimpvmL1 = totimpvm[_n-1]
replace totimpvmL1=. if year==1994
gen totimpvmL2= totimpvmL1[_n-1]
replace totimpvmL2=. if year==1994
gen totimpvmL3= totimpvmL2[_n-1]
replace totimpvmL3=. if year==1994
gen totimpvmL4= totimpvmL3[_n-1]
replace totimpvmL4=. if year==1994
gen totimpvmL5= totimpvmL4[_n-1]
replace totimpvmL5=. if year==1994
gen totimpvmL6= totimpvmL5[_n-1]
replace totimpvmL6=. if year==1994
```

```
*****************************************
**   DO FILE FOR GENERATING COMPOSITE
**   LAGGED VARIABLES
*****************************************

* Set environment variables
*******************************
clear
set memory 128m
set matsize 800


* Select dataset
**********************
use "C:\DATA\final data set in 2002 dollars.dta"


* Generate Lags Functions
*************************************
gen zra6 = (resimpvmL1 + 2*resimpvmL2 + 3*resimpvmL3 + 3*resimpvmL4 + 2*resimpvmL5 +
resimpvmL6)/12
gen zra5 = (resimpvmL1 + 2*resimpvmL2 + 3*resimpvmL3 + 3*resimpvmL4 + 2*resimpvmL5)/11
gen zra4 = (resimpvmL1 + 2*resimpvmL2 + 3*resimpvmL3 + 2*resimpvmL4)/8
gen zra3 = (resimpvmL1 + 2*resimpvmL2 + resimpvmL3)/4

gen zrb6 = (resimpvmL1 + 2*resimpvmL2 + 3*resimpvmL3 + 4*resimpvmL4 + 5*resimpvmL5 +
6*resimpvmL6)/21
gen zrb5 = (resimpvmL1 + 2*resimpvmL2 + 3*resimpvmL3 + 4*resimpvmL4 + 5*resimpvmL5)/15
gen zrb4 = (resimpvmL1 + 2*resimpvmL2 + 3*resimpvmL3 + 4*resimpvmL4)/10
gen zrb3 = (resimpvmL1 + 2*resimpvmL2 + 3*resimpvmL3)/6

gen zrc6 = (6*resimpvmL1 + 5*resimpvmL2 + 4*resimpvmL3 + 3*resimpvmL4 + 2*resimpvmL5 +
resimpvmL6)/21
gen zrc5 = (6*resimpvmL1 + 5*resimpvmL2 + 4*resimpvmL3 + 3*resimpvmL4 + 2*resimpvmL5)/20
gen zrc4 = (6*resimpvmL1 + 5*resimpvmL2 + 4*resimpvmL3 + 3*resimpvmL4)/18
gen zrc3 = (6*resimpvmL1 + 5*resimpvmL2 + 4*resimpvmL3)/15

gen zrd6 = (resimpvmL1 + resimpvmL2 + resimpvmL3 + resimpvmL4 + resimpvmL5 + resimpvmL6)/6
gen zrd5 = (resimpvmL1 + resimpvmL2 + resimpvmL3 + resimpvmL4 + resimpvmL5)/5
gen zrd4 = (resimpvmL1 + resimpvmL2 + resimpvmL3 + resimpvmL4)/4
gen zrd3 = (resimpvmL1 + resimpvmL2 + resimpvmL3)/3


gen zca6 = (cniimpvmL1 + 2*cniimpvmL2 + 3*cniimpvmL3 + 3*cniimpvmL4 + 2*cniimpvmL5 +
cniimpvmL6)/12
gen zca5 = (cniimpvmL1 + 2*cniimpvmL2 + 3*cniimpvmL3 + 3*cniimpvmL4 + 2*cniimpvmL5)/11
gen zca4 = (cniimpvmL1 + 2*cniimpvmL2 + 3*cniimpvmL3 + 2*cniimpvmL4)/8
gen zca3 = (cniimpvmL1 + 2*cniimpvmL2 + cniimpvmL3)/4

gen zcb6 = (cniimpvmL1 + 2*cniimpvmL2 + 3*cniimpvmL3 + 4*cniimpvmL4 + 5*cniimpvmL5 +
6*cniimpvmL6)/21
```

```
gen zcb5 = (cniimpvmL1 + 2*cniimpvmL2 + 3*cniimpvmL3 + 4*cniimpvmL4 + 5*cniimpvmL5)/15
gen zcb4 = (cniimpvmL1 + 2*cniimpvmL2 + 3*cniimpvmL3 + 4*cniimpvmL4)/10
gen zcb3 = (cniimpvmL1 + 2*cniimpvmL2 + 3*cniimpvmL3)/6


gen zcc6 = (6*cniimpvmL1 + 5*cniimpvmL2 + 4*cniimpvmL3 + 3*cniimpvmL4 + 2*cniimpvmL5 +
cniimpvmL6)/21
gen zcc5 = (6*cniimpvmL1 + 5*cniimpvmL2 + 4*cniimpvmL3 + 3*cniimpvmL4 + 2*cniimpvmL5)/20
gen zcc4 = (6*cniimpvmL1 + 5*cniimpvmL2 + 4*cniimpvmL3 + 3*cniimpvmL4)/18
gen zcc3 = (6*cniimpvmL1 + 5*cniimpvmL2 + 4*cniimpvmL3)/15

gen zcd6 = (cniimpvmL1 + cniimpvmL2 + cniimpvmL3 + cniimpvmL4 + cniimpvmL5 + cniimpvmL6)/6
gen zcd5 = (cniimpvmL1 + cniimpvmL2 + cniimpvmL3 + cniimpvmL4 + cniimpvmL5)/5
gen zcd4 = (cniimpvmL1 + cniimpvmL2 + cniimpvmL3 + cniimpvmL4)/4
gen zcd3 = (cniimpvmL1 + cniimpvmL2 + cniimpvmL3)/3
```

```
*****************************************
**   DO FILE FOR FIXED EFFECT, CROSS-SECTION
**   REGRESSION ANALYSIS OF CAPITAL
**   EXPENDITURES
*****************************************


* Set cross-section parameters
**************************************
tsset cicoid year

* Begin regressions
*********************
xtreg reclcapm zra6 zca6 if usda==1, fe
mat sderr = vecdiag(cholesky(diag(vecdiag(e(V)))))
mat sqrmatsd = diag(sderr)
mat t = e(b) * syminv(sqrmatsd)
mat t2 = t[1,1..2]
mat r1 = t2'
```

[These last 6 lines were repeated 256 times, once for every possible combination of lags lengths and shapes for each group (5) for each capital expenditure variable (2) for a total of 2,560 regressions. Rather than list them all here, only one is shown for example purposes.]

APPENDIX D

REGRESSION RESULTS

The following tables present the t-scores for the more than 2,500 of fixed-effect panel data regressions used in this analysis. For ease of presentation, only the t-scores are presented here. For each regression, the capital expenditure variable (public safety or recreation/libraries) was the dependent variable and residential and commercial/industrial digest values were the two independent variables. As was described in Chapter 3, each digest value was tested using four different lags lengths and four lag shapes, resulting in 16 variables. Each residential variable was run with each commercial/industrial variable, so the result was 256 regressions per capital expenditure (2 types) per region (5 regions).

For ease of organizing the data, the following naming scheme was used for these variables. The "z" at the beginning of each one identified it as a weighted composite variable. The "r" or "c" identified it as residential or commercial. The "a," "b," "c," or "d" identified the lag shape, and the number at the end of the name represented the number of periods the data was lagged. For example, the variable zrb4 would represent the residential digest lagged 4 periods using lag shape "B."

For each table, the residential t-scores are presented in the top matrix, and the commercial/industrial t-scores are presented in the bottom matrix. The columns are the variable the t-score represents, and the rows are the variable that was paired with the column variable to get that particular t-score. In addition, for each column a minimum, maximum, and average t-score have been calculated to help quickly analyze the range and trend of the results. Below each matrix, a minimum, maximum, and average t-score have been calculated for the entire lag length.

Tables D-11 and D-12 are slightly different in that they show the results of the regressions using the truncated datasets that were run to test the validity of the significant results for the short lag periods for public safety capital expenditures in the Atlanta Metro Group and recreation and library capital expenditures in the Non-Metro Urban Group. The lines in the tables show the groups of regression results that were a result of the truncated data. For example, any regression that included a 6-lag period composite variable would not have been truncated and would have used the full dataset (the first four columns and first four rows). However, any regression that included a 5-lag composite variable as its longest lag would have used a dataset that truncated the first year of data. Those results would be in columns five through eight (minus the first four rows) and rows five through eight (minus the first four columns). This continued until the bottom corner of the tables where the regressions used only composite variables with three lagged periods. By comparing the results of these 16 regressions using the full dataset with the ones shown in Tables D-11 and D-12, the impact of additional data on the significance of the results can be easily demonstrated. In Tables D-2 and D-9 (full data) and Tables D-11 and D-12, these 16 regressions are shaded.

Table D-1
T-Scores for Public Safety Expenditues - Super Metro Group

Residential

	zra6	zrb6	zrc6	zrd6	zra5	zrb5	zrc5	zrd5	zra4	zrb4	zrc4	zrd4	zra3	zrb3	zrc3	zrd3
zca6	0.72	0.95	0.76	0.93	0.52	0.92	0.71	0.81	0.62	0.41	0.67	0.56	0.91	0.32	0.72	0.54
zcb6	0.47	1.12	0.56	0.78	0.30	0.78	0.52	0.61	0.44	0.19	0.48	0.35	0.80	0.17	0.56	0.37
zcc6	0.78	0.91	0.84	0.96	0.59	0.95	0.79	0.88	0.69	0.50	0.75	0.65	0.96	0.37	0.80	0.60
zcd6	0.68	0.96	0.74	0.95	0.47	0.93	0.68	0.80	0.58	0.34	0.64	0.52	0.90	0.27	0.70	0.50
zca5	0.89	1.10	0.90	1.07	0.84	0.78	0.96	0.94	1.07	0.64	0.95	0.85	1.41	0.78	0.99	0.94
zcb5	0.49	0.70	0.58	0.70	0.68	0.65	0.84	0.83	0.93	0.47	0.84	0.72	1.29	0.66	0.88	0.82
zcc5	0.80	0.90	0.86	0.96	0.75	0.68	0.90	0.87	1.00	0.55	0.90	0.78	1.37	0.72	0.94	0.88
zcd5	0.67	0.82	0.74	0.86	0.71	0.65	0.87	0.84	0.96	0.50	0.86	0.74	1.33	0.68	0.91	0.84
zca4	0.99	1.20	0.98	1.18	0.80	0.72	0.92	0.89	1.40	0.73	1.44	1.23	1.88	1.07	1.50	1.39
zcb4	0.70	0.81	0.77	0.84	0.84	0.78	0.97	0.94	1.52	0.92	1.56	1.39	1.93	1.21	1.61	1.50
zcc4	0.84	0.93	0.91	1.00	0.77	0.70	0.92	0.88	1.23	0.61	1.32	1.08	1.73	0.96	1.40	1.26
zcd4	0.76	0.87	0.83	0.91	0.79	0.73	0.93	0.90	1.33	0.68	1.41	1.19	1.80	1.04	1.47	1.34
zca3	1.09	1.45	1.06	1.39	0.68	0.61	0.83	0.78	1.20	0.60	1.28	1.04	0.73	0.18	0.80	0.56
zcb3	1.32	1.75	1.18	1.48	1.00	0.91	1.07	1.05	1.67	1.01	1.65	1.46	0.89	0.38	0.94	0.74
zcc3	0.91	0.98	0.97	1.07	0.76	0.70	0.91	0.88	1.20	0.63	1.30	1.05	0.22	-0.26	0.30	0.03
zcd3	1.20	1.38	1.13	1.37	0.87	0.79	0.98	0.96	1.37	0.73	1.43	1.20	0.51	-0.04	0.60	0.34
Min:	0.47	0.70	0.56	0.70	0.30	0.61	0.52	0.61	0.44	0.19	0.48	0.35	0.22	-0.26	0.30	0.03
Max:	1.32	1.75	1.18	1.48	1.00	0.95	1.07	1.05	1.67	1.01	1.65	1.46	1.93	1.21	1.61	1.50
Ave:	0.83	1.05	0.86	1.03	0.71	0.77	0.86	0.87	1.08	0.59	1.09	0.93	1.17	0.53	0.95	0.79

	6-lag:	Min:	0.47		**5-lag:**	Min:	0.30		**4-lag:**	Min:	0.19		**3-lag:**	Min:	-0.26	
		Max:	1.75			Max:	1.07			Max:	1.67			Max:	1.93	
		Ave:	0.94			Ave:	0.80			Ave:	0.92			Ave:	0.86	

Commercial/Industrial

	zca6	zcb6	zcc6	zcd6	zca5	zcb5	zcc5	zcd5	zca4	zcb4	zcc4	zcd4	zca3	zcb3	zcc3	zcd3
zra6	-0.46	-0.23	-0.51	-0.45	-0.63	-0.22	-0.51	-0.40	-0.73	-0.35	-0.55	-0.44	-0.86	-1.04	-0.62	-0.94
zrb6	-0.69	-0.97	-0.59	-0.73	-0.81	-0.43	-0.56	-0.52	-0.91	-0.42	-0.57	-0.49	-1.21	-1.46	-0.63	-1.09
zrc6	-0.44	-0.26	-0.52	-0.45	-0.56	-0.26	-0.53	-0.42	-0.65	-0.36	-0.56	-0.46	-0.76	-0.82	-0.64	-0.80
zrd6	-0.65	-0.57	-0.67	-0.71	-0.77	-0.42	-0.65	-0.57	-0.88	-0.45	-0.67	-0.55	-1.13	-1.17	-0.75	-1.08
zra5	-0.23	-0.01	-0.29	-0.19	-0.31	-0.17	-0.20	-0.20	-0.24	-0.21	-0.20	-0.21	-0.09	-0.41	-0.19	-0.33
zrb5	-0.64	-0.56	-0.64	-0.68	-0.27	-0.25	-0.16	-0.20	-0.17	-0.18	-0.15	-0.17	-0.02	-0.29	-0.13	-0.23
zrc5	-0.37	-0.19	-0.45	-0.37	-0.27	-0.22	-0.24	-0.24	-0.21	-0.21	-0.24	-0.23	-0.10	-0.30	-0.24	-0.29
zrd5	-0.50	-0.34	-0.56	-0.52	-0.35	-0.33	-0.29	-0.32	-0.27	-0.27	-0.28	-0.28	-0.13	-0.37	-0.28	-0.35
zra4	-0.26	-0.09	-0.33	-0.24	-0.41	-0.27	-0.34	-0.32	-0.45	-0.46	-0.18	-0.32	-0.18	-0.68	-0.10	-0.38
zrb4	-0.14	0.12	-0.25	-0.09	-0.12	0.00	-0.03	-0.02	0.08	-0.16	0.32	0.13	0.39	-0.10	0.40	0.18
zrc4	-0.32	-0.14	-0.41	-0.31	-0.21	-0.16	-0.20	-0.18	-0.31	-0.36	-0.22	-0.30	-0.12	-0.45	-0.17	-0.33
zrd4	-0.25	-0.03	-0.36	-0.23	-0.23	-0.15	-0.18	-0.17	-0.29	-0.42	-0.11	-0.26	-0.01	-0.44	-0.02	-0.24
zra3	-0.40	-0.33	-0.44	-0.41	-0.51	-0.40	-0.50	-0.46	-0.61	-0.50	-0.42	-0.47	-0.34	-0.49	0.24	-0.10
zrb3	0.09	0.25	0.05	0.13	-0.06	0.10	0.02	0.06	-0.03	-0.02	0.20	0.10	0.17	-0.06	0.70	0.40
zrc3	-0.34	-0.19	-0.42	-0.34	-0.18	-0.13	-0.17	-0.16	-0.24	-0.26	-0.19	-0.23	-0.37	-0.49	0.15	-0.17
zrd3	-0.17	0.00	-0.22	-0.14	-0.20	-0.09	-0.15	-0.13	-0.29	-0.27	-0.13	-0.20	-0.19	-0.38	0.39	0.04
Min:	-0.69	-0.97	-0.67	-0.73	-0.81	-0.43	-0.65	-0.57	-0.91	-0.50	-0.67	-0.55	-1.21	-1.46	-0.75	-1.09
Max:	0.09	0.25	0.05	0.13	-0.06	0.10	0.02	0.06	0.08	-0.02	0.32	0.13	0.39	-0.06	0.70	0.40
Ave:	-0.36	-0.22	-0.41	-0.36	-0.37	-0.21	-0.29	-0.27	-0.39	-0.31	-0.25	-0.27	-0.31	-0.56	-0.12	-0.36

	6-lag:	Min:	-0.97		**5-lag:**	Min:	-0.81		**4-lag:**	Min:	-0.91		**3-lag:**	Min:	-1.46	
		Max:	0.25			Max:	0.10			Max:	0.32			Max:	0.70	
		Ave:	-0.34			Ave:	-0.28			Ave:	-0.30			Ave:	-0.34	

Table D-2
T-Scores for Public Safety Expenditues - Atlanta Metro Group

Residential

	zra6	zrb6	zrc6	zrd6	zra5	zrb5	zrc5	zrd5	zra4	zrb4	zrc4	zrd4	zra3	zrb3	zrc3	zrd3
zca6	0.76	0.61	1.03	0.83	0.80	0.65	1.10	0.89	1.01	0.99	1.19	1.10	1.21	0.73	1.22	0.99
zcb6	0.78	0.63	1.06	0.86	0.82	0.67	1.13	0.92	1.03	1.01	1.22	1.14	1.24	0.75	1.26	1.02
zcc6	0.52	0.38	0.76	0.58	0.56	0.40	0.82	0.62	0.77	0.76	0.91	0.85	0.97	0.51	0.94	0.73
zcd6	0.63	0.48	0.88	0.69	0.67	0.51	0.95	0.74	0.88	0.86	1.04	0.96	1.08	0.61	1.07	0.85
zca5	0.70	0.56	0.97	0.77	1.17	0.93	1.58	1.27	1.45	1.28	1.72	1.52	1.75	1.27	1.82	1.56
zcb5	0.95	0.80	1.22	1.03	1.36	1.12	1.78	1.47	1.64	1.47	1.91	1.71	1.93	1.45	2.02	1.75
zcc5	0.49	0.35	0.72	0.54	0.91	0.66	1.30	1.00	1.19	1.02	1.44	1.25	1.50	1.02	1.55	1.30
zcd5	0.72	0.57	0.97	0.78	1.12	0.87	1.52	1.21	1.40	1.22	1.65	1.46	1.70	1.22	1.76	1.50
zca4	0.56	0.42	0.80	0.62	1.03	0.78	1.43	1.13	1.59	1.36	1.94	1.67	1.94	1.46	2.10	1.80
zcb4	0.70	0.55	0.96	0.77	1.20	0.96	1.62	1.31	1.68	1.44	2.03	1.75	2.02	1.54	2.19	1.88
zcc4	0.38	0.24	0.61	0.43	0.83	0.58	1.21	0.91	1.34	1.11	1.69	1.42	1.70	1.21	1.85	1.55
zcd4	0.54	0.39	0.78	0.60	1.01	0.76	1.41	1.11	1.50	1.26	1.85	1.57	1.85	1.37	2.01	1.70
zca3	0.49	0.34	0.70	0.53	0.84	0.59	1.23	0.92	1.51	1.29	1.86	1.59	1.98	1.55	2.16	1.87
zcb3	0.48	0.33	0.72	0.53	1.03	0.78	1.43	1.13	1.64	1.41	1.99	1.72	2.04	1.59	2.23	1.92
zcc3	0.29	0.15	0.50	0.33	0.71	0.46	1.09	0.79	1.26	1.03	1.60	1.33	1.84	1.41	2.02	1.72
zcd3	0.37	0.22	0.59	0.41	0.86	0.61	1.25	0.95	1.44	1.21	1.79	1.52	1.93	1.49	2.11	1.81
Min:	0.29	0.15	0.50	0.33	0.56	0.40	0.82	0.62	0.77	0.76	0.91	0.85	0.97	0.51	0.94	0.73
Max:	0.95	0.80	1.22	1.03	1.36	1.12	1.78	1.47	1.68	1.47	2.03	1.75	2.04	1.59	2.23	1.92
Ave:	0.59	0.44	0.83	0.64	0.93	0.71	1.30	1.02	1.33	1.17	1.61	1.41	1.67	1.20	1.77	1.50

	6-lag:	Min:	0.15		**5-lag:**	Min:	0.40		**4-lag:**	Min:	0.76		**3-lag:**	Min:	0.51	
		Max:	1.22			Max:	1.78			Max:	2.03			Max:	2.23	
		Ave:	0.62			Ave:	0.99			Ave:	1.38			Ave:	1.53	

Commercial/Industrial

	zca6	zcb6	zcc6	zcd6	zca5	zcb5	zcc5	zcd5	zca4	zcb4	zcc4	zcd4	zca3	zcb3	zcc3	zcd3
zra6	0.77	0.70	1.07	0.92	0.83	0.58	1.12	0.86	1.02	0.86	1.25	1.06	1.17	1.05	1.36	1.22
zrb6	0.87	0.80	1.18	1.03	0.94	0.67	1.23	0.96	1.12	0.96	1.36	1.16	1.27	1.16	1.48	1.34
zrc6	0.45	0.38	0.77	0.61	0.52	0.27	0.82	0.55	0.71	0.57	0.95	0.76	0.87	0.73	1.07	0.92
zrd6	0.65	0.58	0.96	0.80	0.72	0.46	1.01	0.74	0.91	0.75	1.14	0.95	1.06	0.93	1.26	1.12
zra5	0.75	0.69	1.06	0.90	1.23	0.99	1.56	1.30	1.42	1.22	1.68	1.45	1.65	1.41	1.82	1.62
zrb5	0.79	0.73	1.11	0.95	1.34	1.09	1.69	1.41	1.54	1.33	1.81	1.58	1.78	1.53	1.95	1.75
zrc5	0.39	0.31	0.70	0.54	0.87	0.62	1.19	0.93	1.06	0.88	1.31	1.10	1.27	1.05	1.44	1.25
zrd5	0.57	0.50	0.89	0.73	1.09	0.83	1.42	1.15	1.28	1.08	1.54	1.32	1.51	1.27	1.68	1.48
zra4	0.63	0.56	0.92	0.77	1.09	0.86	1.41	1.16	1.42	1.32	1.68	1.51	1.54	1.36	1.78	1.58
zrb4	0.66	0.59	0.95	0.80	1.17	0.94	1.50	1.24	1.55	1.44	1.83	1.65	1.68	1.50	1.93	1.72
zrc4	0.31	0.23	0.63	0.46	0.78	0.53	1.10	0.83	1.13	1.03	1.39	1.22	1.25	1.09	1.48	1.29
zrd4	0.46	0.39	0.76	0.60	0.95	0.71	1.27	1.01	1.32	1.22	1.59	1.41	1.45	1.27	1.69	1.49
zra3	0.45	0.38	0.74	0.59	0.94	0.71	1.24	0.99	1.22	1.13	1.47	1.32	1.47	1.37	1.62	1.51
zrb3	0.86	0.80	1.15	1.01	1.23	1.00	1.55	1.30	1.52	1.42	1.79	1.62	1.75	1.65	1.91	1.79
zrc3	0.25	0.17	0.57	0.40	0.70	0.44	1.01	0.75	1.03	0.93	1.28	1.12	1.26	1.17	1.41	1.30
zrd3	0.54	0.47	0.85	0.69	0.94	0.70	1.26	1.01	1.25	1.16	1.51	1.35	1.50	1.39	1.64	1.53
Min:	0.25	0.17	0.57	0.40	0.52	0.27	0.82	0.55	0.71	0.57	0.95	0.76	0.87	0.73	1.07	0.92
Max:	0.87	0.80	1.18	1.03	1.34	1.09	1.69	1.41	1.55	1.44	1.83	1.65	1.78	1.65	1.95	1.79
Ave:	0.59	0.52	0.89	0.74	0.96	0.71	1.27	1.01	1.22	1.08	1.47	1.29	1.41	1.25	1.60	1.43

	6-lag:	Min:	0.17		**5-lag:**	Min:	0.27		**4-lag:**	Min:	0.57		**3-lag:**	Min:	0.73	
		Max:	1.18			Max:	1.69			Max:	1.83			Max:	1.95	
		Ave:	0.68			Ave:	0.99			Ave:	1.27			Ave:	1.42	

Table D-3
T-Scores for Public Safety Expenditues - Smaller Metro Group

Residential

	zra6	zrb6	zrc6	zrd6	zra5	zrb5	zrc5	zrd5	zra4	zrb4	zrc4	zrd4	zra3	zrb3	zrc3	zrd3
zca6	2.54	4.06	1.98	3.05	1.75	2.90	1.60	2.28	1.13	1.47	1.29	1.43	0.77	1.06	1.17	1.17
zcb6	2.49	3.97	1.93	2.97	1.71	2.86	1.56	2.23	1.11	1.44	1.26	1.40	0.76	1.04	1.15	1.15
zcc6	2.47	3.99	1.93	2.99	1.69	2.83	1.54	2.22	1.08	1.41	1.23	1.37	0.72	1.02	1.11	1.11
zcd6	2.48	3.98	1.93	2.99	1.70	2.84	1.55	2.22	1.09	1.42	1.24	1.37	0.73	1.02	1.12	1.12
zca5	2.58	4.10	2.01	3.10	1.13	2.68	0.41	1.47	0.24	0.93	-0.03	0.42	-0.33	0.07	-0.28	-0.11
zcb5	2.50	3.99	1.94	3.00	1.14	2.66	0.43	1.47	0.27	0.94	0.00	0.44	-0.28	0.10	-0.24	-0.07
zcc5	2.47	3.99	1.93	3.00	1.04	2.58	0.27	1.36	0.15	0.85	-0.18	0.30	-0.43	-0.01	-0.45	-0.24
zcd5	2.48	3.99	1.93	3.00	1.07	2.60	0.33	1.40	0.19	0.88	-0.12	0.35	-0.38	0.03	-0.37	-0.18
zca4	2.59	4.14	2.03	3.13	1.12	2.67	0.38	1.46	1.36	1.74	1.25	1.52	0.94	1.28	1.06	1.20
zcb4	2.60	4.11	2.03	3.11	1.16	2.70	0.44	1.50	1.32	1.69	1.19	1.47	0.89	1.24	1.02	1.15
zcc4	2.46	3.99	1.93	3.00	1.03	2.57	0.25	1.34	1.35	1.73	1.25	1.52	0.92	1.26	1.07	1.19
zcd4	2.52	4.05	1.98	3.05	1.08	2.62	0.33	1.41	1.34	1.72	1.23	1.50	0.91	1.25	1.05	1.18
zca3	2.56	4.13	2.01	3.12	1.09	2.65	0.33	1.42	1.40	1.78	1.30	1.57	1.99	2.29	2.08	2.22
zcb3	2.62	4.18	2.05	3.16	1.13	2.69	0.39	1.47	1.36	1.74	1.24	1.51	1.96	2.27	2.04	2.20
zcc3	2.43	3.95	1.90	2.96	1.00	2.54	0.21	1.31	1.35	1.73	1.26	1.52	1.93	2.23	2.04	2.18
zcd3	2.52	4.06	1.97	3.06	1.05	2.61	0.28	1.38	1.36	1.74	1.25	1.52	1.95	2.25	2.05	2.19
Min:	2.43	3.95	1.90	2.96	1.00	2.54	0.21	1.31	0.15	0.85	-0.18	0.30	-0.43	-0.01	-0.45	-0.24
Max:	2.62	4.18	2.05	3.16	1.75	2.90	1.60	2.28	1.40	1.78	1.30	1.57	1.99	2.29	2.08	2.22
Ave:	2.52	4.04	1.97	3.04	1.24	2.69	0.64	1.62	1.01	1.45	0.92	1.20	0.82	1.15	0.98	1.09

6-lag:	Min:	1.90	**5-lag:**	Min:	0.21	**4-lag:**	Min:	-0.18	**3-lag:**	Min:	-0.45
	Max:	4.18		Max:	2.90		Max:	1.78		Max:	2.29
	Ave:	2.89		Ave:	1.55		Ave:	1.14		Ave:	1.01

Commercial/Industrial

	zca6	zcb6	zcc6	zcd6	zca5	zcb5	zcc5	zcd5	zca4	zcb4	zcc4	zcd4	zca3	zcb3	zcc3	zcd3
zra6	-0.66	-0.50	-0.48	-0.50	-0.75	-0.53	-0.48	-0.51	-0.78	-0.77	-0.46	-0.61	-0.72	-0.87	-0.38	-0.63
zrb6	-1.20	-0.97	-1.06	-1.04	-1.32	-1.04	-1.07	-1.06	-1.41	-1.32	-1.07	-1.19	-1.40	-1.51	-0.99	-1.26
zrc6	-0.44	-0.28	-0.36	-0.33	-0.51	-0.34	-0.37	-0.36	-0.56	-0.53	-0.37	-0.45	-0.54	-0.62	-0.32	-0.47
zrd6	-0.95	-0.74	-0.85	-0.82	-1.06	-0.82	-0.86	-0.85	-1.13	-1.06	-0.87	-0.97	-1.12	-1.21	-0.80	-1.02
zra5	-0.26	-0.13	-0.09	-0.11	0.72	0.83	0.93	0.90	0.71	0.70	0.95	0.84	0.75	0.65	1.00	0.84
zrb5	-0.72	-0.59	-0.53	-0.56	0.05	0.22	0.24	0.23	0.02	0.05	0.25	0.16	0.04	-0.06	0.30	0.13
zrc5	-0.23	-0.09	-0.15	-0.12	1.09	1.16	1.28	1.24	1.08	1.05	1.29	1.19	1.12	1.04	1.34	1.21
zrd5	-0.56	-0.41	-0.44	-0.43	0.53	0.65	0.71	0.69	0.50	0.51	0.71	0.62	0.53	0.44	0.76	0.61
zra4	0.07	0.17	0.20	0.19	1.19	1.26	1.39	1.35	-0.88	-0.80	-0.86	-0.84	-0.96	-0.87	-0.86	-0.87
zrb4	-0.14	-0.03	0.02	0.00	0.86	0.95	1.07	1.03	-1.05	-0.96	-1.02	-1.00	-1.12	-1.04	-1.03	-1.04
zrc4	-0.05	0.07	0.02	0.04	1.33	1.38	1.54	1.48	-0.84	-0.76	-0.84	-0.81	-0.93	-0.83	-0.86	-0.85
zrd4	-0.15	-0.02	-0.04	-0.03	1.09	1.16	1.28	1.24	-0.98	-0.89	-0.97	-0.94	-1.07	-0.97	-0.99	-0.98
zra3	0.29	0.38	0.40	0.40	1.50	1.54	1.70	1.65	-0.66	-0.59	-0.64	-0.62	-1.17	-1.12	-1.07	-1.10
zrb3	0.14	0.25	0.28	0.27	1.28	1.34	1.48	1.43	-0.82	-0.75	-0.79	-0.78	-1.30	-1.26	-1.19	-1.23
zrc3	0.04	0.16	0.09	0.12	1.47	1.51	1.69	1.62	-0.74	-0.66	-0.74	-0.71	-1.26	-1.20	-1.19	-1.20
zrd3	0.03	0.15	0.14	0.14	1.37	1.42	1.57	1.52	-0.81	-0.73	-0.79	-0.77	-1.32	-1.27	-1.23	-1.26
Min:	-1.20	-0.97	-1.06	-1.04	-1.32	-1.04	-1.07	-1.06	-1.41	-1.32	-1.07	-1.19	-1.40	-1.51	-1.23	-1.26
Max:	0.29	0.38	0.40	0.40	1.50	1.54	1.70	1.65	1.08	1.05	1.29	1.19	1.12	1.04	1.34	1.21
Ave:	-0.30	-0.16	-0.18	-0.17	0.55	0.67	0.76	0.73	-0.52	-0.47	-0.39	-0.43	-0.65	-0.67	-0.47	-0.57

6-lag:	Min:	-1.20	**5-lag:**	Min:	-1.32	**4-lag:**	Min:	-1.41	**3-lag:**	Min:	-1.51
	Max:	0.40		Max:	1.70		Max:	1.29		Max:	1.34
	Ave:	-0.20		Ave:	0.68		Ave:	-0.45		Ave:	-0.59

Table D-4
T-Scores for Public Safety Expenditues - Non-Metro Urban Group

Residential

	zra6	zrb6	zrc6	zrd6	zra5	zrb5	zrc5	zrd5	zra4	zrb4	zrc4	zrd4	zra3	zrb3	zrc3	zrd3
zca6	1.17	1.56	0.71	1.12	0.88	1.24	0.57	0.89	0.66	1.04	0.44	0.75	0.38	0.43	0.27	0.36
zcb6	1.20	1.58	0.75	1.15	0.92	1.26	0.62	0.92	0.71	1.07	0.50	0.79	0.44	0.49	0.33	0.42
zcc6	1.36	1.74	0.90	1.33	1.06	1.42	0.75	1.08	0.84	1.20	0.61	0.94	0.53	0.60	0.41	0.53
zcd6	1.28	1.66	0.81	1.24	0.99	1.34	0.67	1.00	0.77	1.14	0.54	0.86	0.47	0.54	0.36	0.46
zca5	1.26	1.64	0.77	1.21	0.08	0.33	0.08	0.19	-0.05	0.15	0.03	0.09	-0.15	-0.17	0.01	-0.08
zcb5	0.94	1.32	0.52	0.90	0.06	0.25	0.10	0.17	-0.03	0.11	0.08	0.10	-0.08	-0.13	0.06	-0.03
zcc5	1.38	1.76	0.93	1.36	0.37	0.62	0.28	0.45	0.21	0.43	0.20	0.32	0.05	0.09	0.14	0.12
zcd5	1.18	1.56	0.71	1.13	0.16	0.40	0.13	0.25	0.04	0.23	0.07	0.15	-0.08	-0.07	0.03	-0.02
zca4	1.45	1.81	0.97	1.42	0.24	0.51	0.19	0.35	-1.05	-1.15	-0.92	-1.06	-0.91	-0.97	-0.82	-0.91
zcb4	1.20	1.59	0.73	1.15	0.04	0.28	0.07	0.17	-1.03	-1.17	-0.87	-1.04	-0.87	-0.95	-0.76	-0.87
zcc4	1.46	1.83	1.03	1.46	0.48	0.73	0.38	0.56	-0.92	-1.00	-0.85	-0.95	-0.82	-0.84	-0.77	-0.83
zcd4	1.35	1.73	0.88	1.32	0.23	0.49	0.18	0.33	-1.01	-1.12	-0.90	-1.03	-0.88	-0.93	-0.80	-0.88
zca3	1.55	1.90	1.14	1.56	0.52	0.79	0.43	0.62	-0.96	-1.03	-0.87	-0.98	-0.46	-0.73	-0.40	-0.57
zcb3	1.59	1.92	1.13	1.57	0.31	0.59	0.25	0.42	-1.04	-1.13	-0.91	-1.05	-0.49	-0.77	-0.42	-0.59
zcc3	1.50	1.86	1.10	1.52	0.63	0.88	0.52	0.72	-0.85	-0.91	-0.79	-0.88	-0.41	-0.68	-0.36	-0.52
zcd3	1.55	1.90	1.12	1.56	0.46	0.72	0.37	0.55	-0.96	-1.03	-0.87	-0.98	-0.45	-0.73	-0.40	-0.57
Min:	0.94	1.32	0.52	0.90	0.04	0.25	0.07	0.17	-1.05	-1.17	-0.92	-1.06	-0.91	-0.97	-0.82	-0.91
Max:	1.59	1.92	1.14	1.57	1.06	1.42	0.75	1.08	0.84	1.20	0.61	0.94	0.53	0.60	0.41	0.53
Ave:	1.34	1.71	0.89	1.31	0.46	0.74	0.35	0.54	-0.29	-0.20	-0.28	-0.25	-0.23	-0.30	-0.20	-0.25
	6-lag:	Min:	0.52		**5-lag:**	Min:	0.04		**4-lag:**	Min:	-1.17		**3-lag:**	Min:	-0.97	
		Max:	1.92			Max:	1.42			Max:	1.20			Max:	0.60	
		Ave:	1.31			Ave:	0.52			Ave:	-0.26			Ave:	-0.24	

Commercial/Industrial

	zca6	zcb6	zcc6	zcd6	zca5	zcb5	zcc5	zcd5	zca4	zcb4	zcc4	zcd4	zca3	zcb3	zcc3	zcd3
zra6	-0.20	-0.17	-0.49	-0.35	-0.36	0.23	-0.53	-0.19	-0.66	-0.24	-0.66	-0.49	-0.83	-0.90	-0.73	-0.83
zrb6	-0.42	-0.40	-0.70	-0.58	-0.56	0.00	-0.73	-0.41	-0.84	-0.46	-0.85	-0.70	-0.98	-1.03	-0.91	-0.99
zrc6	0.12	0.12	-0.24	-0.07	-0.04	0.54	-0.30	0.10	-0.39	0.08	-0.47	-0.22	-0.67	-0.65	-0.60	-0.64
zrd6	-0.16	-0.15	-0.52	-0.35	-0.34	0.27	-0.57	-0.19	-0.68	-0.21	-0.73	-0.50	-0.91	-0.92	-0.83	-0.90
zra5	0.00	0.01	-0.30	-0.16	1.47	1.73	1.02	1.40	1.16	1.57	0.84	1.21	0.73	1.02	0.62	0.83
zrb5	-0.23	-0.21	-0.51	-0.38	1.32	1.59	0.89	1.25	1.02	1.42	0.72	1.07	0.62	0.89	0.51	0.70
zrc5	0.22	0.20	-0.15	0.02	1.50	1.76	1.04	1.43	1.19	1.60	0.85	1.24	0.74	1.06	0.61	0.84
zrd5	-0.01	0.00	-0.36	-0.19	1.39	1.66	0.93	1.32	1.08	1.49	0.74	1.13	0.63	0.94	0.51	0.73
zra4	0.15	0.15	-0.18	-0.02	1.57	1.81	1.12	1.49	1.66	1.74	1.47	1.63	1.50	1.61	1.34	1.49
zrb4	-0.07	-0.06	-0.34	-0.21	1.46	1.71	1.02	1.39	1.72	1.82	1.51	1.69	1.53	1.66	1.37	1.53
zrc4	0.30	0.27	-0.06	0.10	1.55	1.80	1.10	1.48	1.58	1.65	1.42	1.57	1.45	1.53	1.31	1.44
zrd4	0.10	0.09	-0.25	-0.09	1.49	1.74	1.03	1.41	1.67	1.75	1.48	1.65	1.51	1.61	1.36	1.51
zra3	0.34	0.32	0.00	0.16	1.66	1.89	1.22	1.58	1.58	1.65	1.40	1.55	0.64	0.69	0.56	0.63
zrb3	0.29	0.27	-0.03	0.12	1.65	1.88	1.20	1.57	1.61	1.70	1.42	1.58	0.80	0.86	0.71	0.79
zrc3	0.41	0.37	0.06	0.21	1.60	1.84	1.15	1.53	1.53	1.60	1.38	1.51	0.60	0.65	0.53	0.60
zrd3	0.34	0.31	-0.01	0.15	1.61	1.84	1.16	1.53	1.58	1.65	1.41	1.56	0.71	0.76	0.63	0.70
Min:	-0.42	-0.40	-0.70	-0.58	-0.56	0.00	-0.73	-0.41	-0.84	-0.46	-0.85	-0.70	-0.98	-1.03	-0.91	-0.99
Max:	0.41	0.37	0.06	0.21	1.66	1.89	1.22	1.58	1.72	1.82	1.51	1.69	1.53	1.66	1.37	1.53
Ave:	0.07	0.07	-0.26	-0.10	1.06	1.39	0.67	1.04	0.93	1.18	0.75	0.97	0.50	0.61	0.44	0.53
	6-lag:	Min:	-0.70		**5-lag:**	Min:	-0.73		**4-lag:**	Min:	-0.85		**3-lag:**	Min:	-1.03	
		Max:	0.41			Max:	1.89			Max:	1.82			Max:	1.66	
		Ave:	-0.05			Ave:	1.04			Ave:	0.95			Ave:	0.52	

Table D-5
T-Scores for Public Safety Expenditues - Rural Group

Residential

	zra6	zrb6	zrc6	zrd6	zra5	zrb5	zrc5	zrd5	zra4	zrb4	zrc4	zrd4	zra3	zrb3	zrc3	zrd3
zca6	2.71	3.57	2.20	2.91	1.93	4.18	1.95	3.08	1.01	1.54	1.47	1.55	0.79	0.49	1.39	0.95
zcb6	1.59	2.21	1.55	1.89	1.10	2.87	1.43	2.13	0.52	0.62	1.13	0.91	0.59	0.24	1.24	0.73
zcc6	2.85	3.48	2.45	3.07	2.20	4.02	2.19	3.24	1.31	1.86	1.67	1.84	0.96	0.71	1.51	1.12
zcd6	2.26	2.96	1.95	2.51	1.62	3.57	1.74	2.70	0.83	1.22	1.31	1.31	0.69	0.38	1.27	0.82
zca5	3.28	4.10	2.63	3.45	3.13	4.56	2.41	3.56	2.21	2.98	1.91	2.49	1.51	1.78	1.56	1.72
zcb5	2.24	3.04	1.91	2.48	2.54	4.02	2.03	3.00	1.76	2.38	1.64	2.03	1.28	1.42	1.40	1.45
zcc5	2.99	3.58	2.59	3.20	2.64	3.70	2.17	3.06	1.94	2.48	1.73	2.19	1.36	1.58	1.41	1.55
zcd5	2.68	3.40	2.25	2.90	2.52	3.77	2.02	2.97	1.76	2.34	1.60	2.03	1.23	1.40	1.33	1.41
zca4	3.52	4.21	2.94	3.71	3.32	4.55	2.61	3.73	2.17	2.84	1.68	2.30	1.49	1.85	1.29	1.60
zcb4	3.54	4.50	2.75	3.69	3.32	4.89	2.50	3.74	1.90	2.57	1.49	2.04	1.31	1.61	1.17	1.41
zcc4	3.06	3.62	2.69	3.28	2.72	3.71	2.26	3.13	2.11	2.69	1.64	2.23	1.48	1.83	1.25	1.58
zcd4	3.24	3.93	2.71	3.44	2.88	4.08	2.30	3.31	1.90	2.53	1.46	2.03	1.28	1.61	1.11	1.39
zca3	3.33	3.89	2.93	3.54	3.24	4.26	2.68	3.64	2.50	3.12	1.97	2.62	1.96	2.31	1.66	2.01
zcb3	3.59	4.21	3.06	3.79	3.39	4.52	2.71	3.79	2.28	2.94	1.77	2.41	1.72	2.05	1.46	1.78
zcc3	3.02	3.55	2.69	3.23	2.74	3.67	2.31	3.12	2.29	2.84	1.81	2.40	1.92	2.25	1.62	1.97
zcd3	3.22	3.78	2.82	3.43	2.92	3.93	2.42	3.33	2.21	2.81	1.72	2.33	1.76	2.09	1.47	1.81
Min:	1.59	2.21	1.55	1.89	1.10	2.87	1.43	2.13	0.52	0.62	1.13	0.91	0.59	0.24	1.11	0.73
Max:	3.59	4.50	3.06	3.79	3.39	4.89	2.71	3.79	2.50	3.12	1.97	2.62	1.96	2.31	1.66	2.01
Ave:	2.95	3.63	2.51	3.16	2.64	4.02	2.23	3.22	1.79	2.36	1.63	2.04	1.33	1.48	1.38	1.46

	6-lag:	Min:	1.55		**5-lag:**	Min:	1.10		**4-lag:**	Min:	0.52		**3-lag:**	Min:	0.24	
		Max:	4.50			Max:	4.89			Max:	3.12			Max:	2.31	
		Ave:	3.06			Ave:	3.03			Ave:	1.96			Ave:	1.41	

Commercial/Industrial

	zca6	zcb6	zcc6	zcd6	zca5	zcb5	zcc5	zcd5	zca4	zcb4	zcc4	zcd4	zca3	zcb3	zcc3	zcd3
zra6	-0.85	0.70	-0.64	-0.12	-1.50	-0.28	-0.75	-0.64	-1.71	-1.89	-0.77	-1.32	-1.28	-1.78	-0.52	-1.09
zrb6	-1.61	-0.03	-1.01	-0.73	-2.13	-1.07	-1.06	-1.19	-2.12	-2.65	-0.99	-1.75	-1.47	-2.06	-0.66	-1.29
zrc6	0.01	1.38	-0.17	0.55	-0.67	0.57	-0.37	0.03	-1.11	-0.90	-0.49	-0.73	-1.01	-1.32	-0.37	-0.81
zrd6	-0.83	0.66	-0.68	-0.15	-1.48	-0.26	-0.80	-0.65	-1.73	-1.84	-0.83	-1.35	-1.34	-1.81	-0.58	-1.15
zra5	-0.10	1.34	-0.19	0.50	-1.26	-0.48	-0.20	-0.35	-1.40	-1.54	-0.14	-0.78	-1.07	-1.45	0.16	-0.55
zrb5	-1.86	-0.38	-1.18	-0.99	-2.38	-1.86	-0.81	-1.36	-2.21	-2.83	-0.61	-1.60	-1.55	-2.07	-0.16	-1.02
zrc5	0.30	1.63	0.04	0.80	-0.30	0.44	0.31	0.41	-0.61	-0.46	0.27	-0.07	-0.59	-0.74	0.42	-0.10
zrd5	-0.79	0.66	-0.67	-0.14	-1.43	-0.68	-0.38	-0.56	-1.56	-1.70	-0.30	-0.97	-1.23	-1.58	0.01	-0.71
zra4	0.72	2.02	0.41	1.21	-0.40	0.38	0.32	0.38	0.09	0.42	0.51	0.50	-0.16	-0.03	0.49	0.27
zrb4	0.00	1.50	-0.09	0.63	-1.22	-0.47	-0.12	-0.30	-0.54	-0.35	0.07	-0.12	-0.61	-0.60	0.16	-0.18
zrc4	0.73	2.00	0.37	1.18	0.16	0.88	0.65	0.82	0.72	1.08	0.96	1.08	0.35	0.59	0.85	0.76
zrd4	0.30	1.67	0.07	0.83	-0.58	0.19	0.18	0.20	0.03	0.34	0.43	0.42	-0.22	-0.08	0.42	0.20
zra3	1.14	2.33	0.76	1.57	0.37	1.08	0.85	1.03	0.80	1.16	1.05	1.17	0.55	0.83	0.84	0.87
zrb3	1.17	2.36	0.78	1.60	0.00	0.76	0.61	0.73	0.43	0.77	0.78	0.82	0.23	0.47	0.58	0.55
zrc3	1.01	2.24	0.59	1.42	0.57	1.25	0.96	1.17	1.15	1.51	1.31	1.48	0.90	1.21	1.11	1.19
zrd3	1.04	2.26	0.65	1.47	0.23	0.96	0.73	0.90	0.74	1.10	0.99	1.11	0.52	0.80	0.79	0.83
Min:	-1.86	-0.38	-1.18	-0.99	-2.38	-1.86	-1.06	-1.36	-2.21	-2.83	-0.99	-1.75	-1.55	-2.07	-0.66	-1.29
Max:	1.17	2.36	0.78	1.60	0.57	1.25	0.96	1.17	1.15	1.51	1.31	1.48	0.90	1.21	1.11	1.19
Ave:	0.02	1.40	-0.06	0.60	-0.75	0.09	0.01	0.04	-0.56	-0.49	0.14	-0.13	-0.50	-0.60	0.22	-0.14

	6-lag:	Min:	-1.86		**5-lag:**	Min:	-2.38		**4-lag:**	Min:	-2.83		**3-lag:**	Min:	-2.07	
		Max:	2.36			Max:	1.25			Max:	1.51			Max:	1.21	
		Ave:	0.49			Ave:	-0.15			Ave:	-0.26			Ave:	-0.25	

Table D-6
T-Scores for Recreation and Library Expenditues - Super Metro Group

Residential

	zra6	zrb6	zrc6	zrd6	zra5	zrb5	zrc5	zrd5	zra4	zrb4	zrc4	zrd4	zra3	zrb3	zrc3	zrd3
zca6	3.86	1.80	3.09	3.21	3.85	2.96	2.95	3.15	4.27	2.40	2.84	2.72	4.81	3.09	2.84	3.57
zcb6	3.35	3.67	2.79	4.33	2.92	3.77	2.56	3.01	3.45	1.62	2.41	2.06	5.54	2.64	2.58	3.08
zcc6	3.11	1.38	2.96	2.60	3.46	2.39	2.94	2.88	4.05	2.59	2.90	2.85	4.42	2.87	2.87	3.38
zcd6	4.35	1.83	3.40	3.88	3.86	3.33	3.15	3.52	4.43	2.32	2.98	2.77	5.39	2.92	3.01	3.61
zca5	3.26	1.59	2.70	2.64	4.00	2.66	3.17	3.27	4.08	2.52	3.07	2.97	4.19	3.65	3.06	3.70
zcb5	3.58	1.72	3.19	3.22	4.14	3.84	3.61	4.27	3.96	2.76	3.37	3.31	4.06	3.20	3.31	3.65
zcc5	2.79	1.30	2.78	2.35	3.24	2.24	3.04	2.99	3.61	2.16	2.97	2.75	4.02	3.14	3.01	3.42
zcd5	3.28	1.48	3.08	2.78	3.78	2.80	3.37	3.59	3.91	2.48	3.22	3.07	4.14	3.23	3.20	3.61
zca4	2.85	1.39	2.47	2.36	3.33	2.18	2.82	2.77	3.39	2.48	2.48	2.70	3.20	3.07	2.32	2.84
zcb4	2.66	1.46	2.65	2.31	3.99	2.86	3.50	3.53	3.61	3.43	2.75	3.21	3.23	3.12	2.53	2.98
zcc4	2.59	1.24	2.63	2.19	3.02	2.06	2.90	2.78	2.99	2.17	2.53	2.59	3.07	2.71	2.39	2.75
zcd4	2.65	1.36	2.66	2.27	3.61	2.50	3.26	3.23	3.40	2.72	2.69	2.98	3.21	2.95	2.49	2.92
zca3	2.07	0.97	1.95	1.88	2.29	1.52	2.18	2.03	2.78	1.84	2.18	2.19	3.12	3.00	2.24	2.78
zcb3	2.16	1.24	1.87	1.83	2.73	1.77	2.36	2.24	3.15	2.17	2.29	2.40	3.20	3.53	2.31	2.97
zcc3	2.50	1.14	2.58	2.11	2.63	1.79	2.63	2.46	2.75	1.94	2.40	2.36	2.99	2.81	2.38	2.78
zcd3	2.73	1.27	2.34	2.20	2.91	1.86	2.58	2.46	3.07	2.10	2.40	2.47	3.16	3.16	2.36	2.94
Min:	2.07	0.97	1.87	1.83	2.29	1.52	2.18	2.03	2.75	1.62	2.18	2.06	2.99	2.64	2.24	2.75
Max:	4.35	3.67	3.40	4.33	4.14	3.84	3.61	4.27	4.43	3.43	3.37	3.31	5.54	3.65	3.31	3.70
Ave:	2.99	1.55	2.70	2.64	3.36	2.53	2.94	3.01	3.56	2.36	2.72	2.71	3.86	3.07	2.68	3.19

6-lag:	Min:	0.97	**5-lag:**	Min:	1.52	**4-lag:**	Min:	1.62	**3-lag:**	Min:	2.24
	Max:	4.35		Max:	4.27		Max:	4.43		Max:	5.54
	Ave:	2.47		Ave:	2.96		Ave:	2.84		Ave:	3.20

Commercial/Industrial

	zca6	zcb6	zcc6	zcd6	zca5	zcb5	zcc5	zcd5	zca4	zcb4	zcc4	zcd4	zca3	zcb3	zcc3	zcd3
zra6	-3.50	-3.04	-2.77	-3.98	-2.92	-3.23	-2.46	-2.94	-2.53	-2.29	-2.25	-2.30	-1.81	-1.85	-2.17	-2.42
zrb6	-1.59	-3.50	-1.15	-1.64	-1.37	-1.51	-1.05	-1.25	-1.17	-1.18	-0.97	-1.09	-0.78	-1.03	-0.88	-1.05
zrc6	-2.69	-2.42	-2.57	-3.00	-2.31	-2.79	-2.38	-2.68	-2.09	-2.22	-2.23	-2.25	-1.62	-1.49	-2.19	-1.97
zrd6	-2.89	-4.00	-2.29	-3.56	-2.33	-2.90	-2.03	-2.46	-2.06	-1.95	-1.87	-1.93	-1.63	-1.53	-1.80	-1.91
zra5	-3.39	-2.52	-3.01	-3.41	-3.37	-3.53	-2.65	-3.19	-2.73	-3.28	-2.43	-2.97	-1.72	-2.14	-2.06	-2.35
zrb5	-2.65	-3.48	-2.08	-3.03	-2.19	-3.40	-1.78	-2.37	-1.70	-2.32	-1.59	-2.01	-1.02	-1.25	-1.31	-1.39
zrc5	-2.53	-2.17	-2.52	-2.74	-2.46	-2.92	-2.36	-2.69	-2.11	-2.72	-2.21	-2.53	-1.49	-1.63	-1.96	-1.89
zrd5	-2.77	-2.67	-2.51	-3.15	-2.66	-3.67	-2.41	-3.01	-2.17	-2.84	-2.19	-2.60	-1.44	-1.61	-1.89	-1.88
zra4	-3.64	-2.90	-3.44	-3.81	-3.30	-3.19	-2.87	-3.16	-2.52	-2.65	-2.08	-2.49	-1.91	-2.27	-1.82	-2.20
zrb4	-2.10	-1.32	-2.30	-2.04	-2.05	-2.32	-1.70	-2.03	-1.80	-2.73	-1.42	-2.04	-1.07	-1.43	-1.14	-1.37
zrc4	-2.40	-2.01	-2.46	-2.56	-2.31	-2.64	-2.25	-2.50	-1.59	-1.79	-1.65	-1.80	-1.28	-1.35	-1.51	-1.52
zrd4	-2.35	-1.72	-2.48	-2.42	-2.35	-2.72	-2.16	-2.49	-1.92	-2.38	-1.79	-2.19	-1.37	-1.57	-1.54	-1.69
zra3	-3.80	-4.49	-3.46	-4.34	-3.11	-3.01	-2.99	-3.10	-2.12	-2.04	-1.98	-2.09	-1.89	-1.92	-1.67	-1.90
zrb3	-2.45	-2.03	-2.23	-2.30	-2.80	-2.36	-2.31	-2.40	-2.12	-2.06	-1.70	-1.95	-1.84	-2.39	-1.51	-1.99
zrc3	-2.36	-2.13	-2.39	-2.55	-2.22	-2.50	-2.20	-2.40	-1.34	-1.49	-1.46	-1.53	-1.07	-1.07	-1.21	-1.20
zrd3	-2.98	-2.54	-2.80	-3.03	-2.83	-2.80	-2.59	-2.78	-1.90	-1.95	-1.81	-1.96	-1.65	-1.81	-1.58	-1.81
Min:	-3.80	-4.49	-3.46	-4.34	-3.37	-3.67	-2.99	-3.19	-2.73	-3.28	-2.43	-2.97	-1.91	-2.39	-2.19	-2.42
Max:	-1.59	-1.32	-1.15	-1.64	-1.37	-1.51	-1.05	-1.25	-1.17	-1.18	-0.97	-1.09	-0.78	-1.03	-0.88	-1.05
Ave:	-2.76	-2.68	-2.53	-2.97	-2.54	-2.84	-2.26	-2.59	-1.99	-2.24	-1.85	-2.11	-1.47	-1.65	-1.64	-1.78

6-lag:	Min:	-4.49	**5-lag:**	Min:	-3.67	**4-lag:**	Min:	-3.28	**3-lag:**	Min:	-2.42
	Max:	-1.15		Max:	-1.05		Max:	-0.97		Max:	-0.78
	Ave:	-2.74		Ave:	-2.56		Ave:	-2.05		Ave:	-1.64

Table D-7
T-Scores for Recreation and Library Expenditues - Atlanta Metro Group

Residential

	zra6	zrb6	zrc6	zrd6	zra5	zrb5	zrc5	zrd5	zra4	zrb4	zrc4	zrd4	zra3	zrb3	zrc3	zrd3
zca6	6.17	6.85	5.12	6.00	5.68	6.60	4.79	5.68	5.15	5.61	4.38	5.08	4.64	4.82	3.89	4.47
zcb6	6.19	6.87	5.14	6.02	5.69	6.63	4.80	5.70	5.15	5.61	4.39	5.08	4.64	4.82	3.89	4.47
zcc6	6.27	6.96	5.22	6.11	5.75	6.72	4.87	5.79	5.20	5.68	4.45	5.16	4.69	4.84	3.94	4.52
zcd6	6.22	6.91	5.18	6.06	5.71	6.68	4.83	5.75	5.17	5.64	4.41	5.12	4.66	4.82	3.91	4.49
zca5	6.17	6.85	5.12	6.00	5.57	6.30	4.74	5.51	5.04	5.69	4.37	5.05	4.43	4.73	3.93	4.38
zcb5	6.27	6.92	5.23	6.08	5.53	6.25	4.71	5.47	5.01	5.65	4.36	5.02	4.42	4.71	3.92	4.36
zcc5	6.28	6.97	5.23	6.13	5.61	6.37	4.78	5.57	5.07	5.74	4.40	5.10	4.45	4.74	3.95	4.40
zcd5	6.26	6.93	5.22	6.09	5.56	6.31	4.74	5.51	5.03	5.69	4.37	5.05	4.43	4.72	3.92	4.37
zca4	6.20	6.89	5.15	6.04	5.61	6.35	4.77	5.55	5.49	5.96	4.92	5.46	4.98	5.32	4.55	4.97
zcb4	6.12	6.79	5.05	5.92	5.55	6.27	4.71	5.48	5.40	5.87	4.83	5.37	4.90	5.24	4.48	4.89
zcc4	6.31	7.01	5.25	6.15	5.64	6.40	4.80	5.59	5.50	5.99	4.92	5.48	4.98	5.33	4.55	4.97
zcd4	6.20	6.88	5.13	6.03	5.59	6.33	4.75	5.53	5.45	5.93	4.88	5.42	4.94	5.28	4.51	4.93
zca3	6.34	7.03	5.32	6.20	5.66	6.42	4.82	5.62	5.55	6.02	4.98	5.52	5.91	6.15	5.54	5.87
zcb3	6.20	6.91	5.16	6.06	5.66	6.41	4.82	5.61	5.54	6.01	4.97	5.51	5.92	6.16	5.54	5.88
zcc3	6.38	7.10	5.33	6.25	5.68	6.45	4.84	5.64	5.54	6.02	4.96	5.51	5.87	6.10	5.49	5.83
zcd3	6.29	7.00	5.25	6.16	5.67	6.43	4.82	5.62	5.54	6.01	4.96	5.51	5.89	6.12	5.51	5.85
Min:	6.12	6.79	5.05	5.92	5.53	6.25	4.71	5.47	5.01	5.61	4.36	5.02	4.42	4.71	3.89	4.36
Max:	6.38	7.10	5.33	6.25	5.75	6.72	4.87	5.79	5.55	6.02	4.98	5.52	5.92	6.16	5.54	5.88
Ave:	6.24	6.93	5.19	6.08	5.64	6.43	4.79	5.60	5.30	5.82	4.66	5.28	4.98	5.24	4.47	4.92
	6-lag:	Min:	5.05		**5-lag:**	Min:	4.71		**4-lag:**	Min:	4.36		**3-lag:**	Min:	3.89	
		Max:	7.10			Max:	6.72			Max:	6.02			Max:	6.16	
		Ave:	6.11			Ave:	5.61			Ave:	5.26			Ave:	4.90	

Commercial/Industrial

	zca6	zcb6	zcc6	zcd6	zca5	zcb5	zcc5	zcd5	zca4	zcb4	zcc4	zcd4	zca3	zcb3	zcc3	zcd3
zra6	-0.94	-1.00	-1.22	-1.13	-0.98	-0.79	-1.24	-1.03	-1.11	-0.88	-1.34	-1.12	-1.27	-1.28	-1.49	-1.40
zrb6	-1.13	-1.21	-1.42	-1.34	-1.18	-0.96	-1.45	-1.21	-1.32	-1.07	-1.55	-1.32	-1.46	-1.52	-1.71	-1.63
zrc6	-1.04	-1.09	-1.29	-1.21	-1.08	-0.95	-1.31	-1.14	-1.19	-0.91	-1.38	-1.15	-1.39	-1.38	-1.53	-1.47
zrd6	-1.19	-1.26	-1.47	-1.39	-1.24	-1.06	-1.49	-1.28	-1.37	-1.09	-1.59	-1.34	-1.55	-1.58	-1.74	-1.68
zra5	-0.69	-0.74	-0.95	-0.86	-0.95	-0.77	-1.14	-0.97	-1.07	-0.87	-1.21	-1.04	-1.23	-1.16	-1.31	-1.24
zrb5	-1.32	-1.41	-1.60	-1.53	-1.37	-1.21	-1.57	-1.41	-1.49	-1.27	-1.64	-1.46	-1.68	-1.58	-1.75	-1.67
zrc5	-0.94	-0.99	-1.17	-1.10	-0.83	-0.71	-1.00	-0.87	-0.93	-0.72	-1.06	-0.89	-1.11	-1.00	-1.16	-1.09
zrd5	-1.21	-1.28	-1.48	-1.41	-1.15	-1.00	-1.34	-1.19	-1.26	-1.04	-1.40	-1.22	-1.45	-1.34	-1.51	-1.43
zra4	-0.49	-0.53	-0.75	-0.66	-0.67	-0.51	-0.85	-0.69	-1.15	-0.98	-1.30	-1.15	-1.27	-1.21	-1.39	-1.30
zrb4	-0.63	-0.65	-0.89	-0.79	-1.01	-0.82	-1.20	-1.03	-1.37	-1.22	-1.54	-1.39	-1.48	-1.42	-1.62	-1.52
zrc4	-0.77	-0.81	-0.99	-0.92	-0.65	-0.55	-0.82	-0.70	-1.01	-0.85	-1.15	-1.01	-1.13	-1.06	-1.23	-1.15
zrd4	-0.84	-0.88	-1.10	-1.01	-0.90	-0.75	-1.08	-0.93	-1.23	-1.08	-1.39	-1.24	-1.35	-1.28	-1.47	-1.38
zra3	-0.44	-0.48	-0.68	-0.60	-0.36	-0.24	-0.52	-0.39	-0.90	-0.72	-1.03	-0.89	-0.85	-0.85	-0.87	-0.86
zrb3	-0.08	-0.12	-0.30	-0.22	-0.43	-0.27	-0.58	-0.44	-1.02	-0.84	-1.15	-1.00	-0.88	-0.90	-0.89	-0.90
zrc3	-0.60	-0.65	-0.79	-0.74	-0.45	-0.37	-0.60	-0.50	-0.84	-0.68	-0.96	-0.83	-0.85	-0.84	-0.86	-0.86
zrd3	-0.51	-0.56	-0.73	-0.66	-0.52	-0.40	-0.68	-0.55	-0.97	-0.80	-1.10	-0.96	-0.91	-0.91	-0.92	-0.92
Min:	-1.32	-1.41	-1.60	-1.53	-1.37	-1.21	-1.57	-1.41	-1.49	-1.27	-1.64	-1.46	-1.68	-1.58	-1.75	-1.68
Max:	-0.08	-0.12	-0.30	-0.22	-0.36	-0.24	-0.52	-0.39	-0.84	-0.68	-0.96	-0.83	-0.85	-0.84	-0.86	-0.86
Ave:	-0.80	-0.85	-1.05	-0.97	-0.86	-0.71	-1.05	-0.90	-1.14	-0.94	-1.30	-1.13	-1.24	-1.21	-1.34	-1.28
	6-lag:	Min:	-1.60		**5-lag:**	Min:	-1.57		**4-lag:**	Min:	-1.64		**3-lag:**	Min:	-1.75	
		Max:	-0.08			Max:	-0.24			Max:	-0.68			Max:	-0.84	
		Ave:	-0.92			Ave:	-0.88			Ave:	-1.13			Ave:	-1.27	

Table D-8
T-Scores for Recreation and Library Expenditues - Smaller Metro Group

Residential

	zra6	zrb6	zrc6	zrd6	zra5	zrb5	zrc5	zrd5	zra4	zrb4	zrc4	zrd4	zra3	zrb3	zrc3	zrd3
zca6	0.38	0.03	-0.17	-0.08	0.59	0.35	-0.20	0.06	0.43	0.34	-0.30	0.00	0.14	0.87	-0.47	0.26
zcb6	0.48	0.15	-0.03	0.06	0.69	0.44	-0.06	0.18	0.55	0.44	-0.15	0.14	0.27	0.98	-0.31	0.39
zcc6	0.66	0.27	0.10	0.19	0.88	0.62	0.07	0.34	0.72	0.64	-0.05	0.30	0.40	1.14	-0.25	0.53
zcd6	0.58	0.21	0.03	0.12	0.79	0.53	0.00	0.26	0.63	0.55	-0.11	0.21	0.33	1.06	-0.30	0.45
zca5	0.39	0.03	-0.17	-0.08	0.81	0.56	0.28	0.42	0.72	0.60	0.22	0.41	0.52	1.09	0.11	0.60
zcb5	0.25	-0.07	-0.32	-0.21	0.64	0.41	0.12	0.26	0.56	0.43	0.06	0.23	0.37	0.91	-0.04	0.43
zcc5	0.69	0.30	0.13	0.22	1.11	0.83	0.57	0.71	1.03	0.89	0.50	0.70	0.82	1.39	0.38	0.91
zcd5	0.49	0.12	-0.09	0.01	0.90	0.63	0.35	0.50	0.81	0.68	0.28	0.48	0.61	1.17	0.17	0.68
zca4	0.53	0.15	-0.02	0.06	0.96	0.69	0.42	0.57	-0.75	-0.92	-1.30	-1.16	-0.92	-0.21	-1.35	-0.82
zcb4	0.39	0.04	-0.15	-0.06	0.84	0.59	0.32	0.46	-0.99	-1.14	-1.53	-1.39	-1.15	-0.45	-1.58	-1.05
zcc4	0.78	0.38	0.23	0.32	1.21	0.91	0.67	0.81	-0.49	-0.67	-1.02	-0.88	-0.66	0.04	-1.08	-0.54
zcd4	0.60	0.22	0.04	0.13	1.03	0.75	0.49	0.64	-0.71	-0.88	-1.26	-1.11	-0.88	-0.18	-1.32	-0.78
zca3	0.69	0.28	0.14	0.22	1.11	0.82	0.57	0.71	-0.56	-0.74	-1.10	-0.96	-1.92	-1.34	-2.45	-1.94
zcb3	0.54	0.16	-0.01	0.08	0.95	0.68	0.42	0.56	-0.69	-0.86	-1.24	-1.09	-2.08	-1.50	-2.62	-2.11
zcc3	0.89	0.48	0.35	0.43	1.31	1.00	0.78	0.92	-0.37	-0.55	-0.89	-0.75	-1.75	-1.19	-2.28	-1.77
zcd3	0.72	0.31	0.16	0.24	1.14	0.84	0.59	0.74	-0.52	-0.70	-1.06	-0.91	-1.90	-1.33	-2.44	-1.93
Min:	0.25	-0.07	-0.32	-0.21	0.59	0.35	-0.20	0.06	-0.99	-1.14	-1.53	-1.39	-2.08	-1.50	-2.62	-2.11
Max:	0.89	0.48	0.35	0.43	1.31	1.00	0.78	0.92	1.03	0.89	0.50	0.70	0.82	1.39	0.38	0.91
Ave:	0.57	0.19	0.01	0.10	0.94	0.67	0.34	0.51	0.02	-0.12	-0.56	-0.36	-0.49	0.15	-0.99	-0.42
	6-lag:	Min:	-0.32		**5-lag:**	Min:	-0.20		**4-lag:**	Min:	-1.53		**3-lag:**	Min:	-2.62	
		Max:	0.89			Max:	1.31			Max:	1.03			Max:	1.39	
		Ave:	0.22			Ave:	0.61			Ave:	-0.25			Ave:	-0.44	

Commercial/Industrial

	zca6	zcb6	zcc6	zcd6	zca5	zcb5	zcc5	zcd5	zca4	zcb4	zcc4	zcd4	zca3	zcb3	zcc3	zcd3
zra6	1.30	1.21	0.81	0.98	1.22	1.65	0.75	1.15	0.93	1.24	0.58	0.89	0.65	0.84	0.39	0.62
zrb6	1.53	1.43	1.04	1.21	1.46	1.87	0.98	1.38	1.18	1.48	0.81	1.13	0.90	1.11	0.62	0.87
zrc6	1.56	1.44	1.04	1.22	1.49	1.91	0.98	1.40	1.20	1.51	0.79	1.14	0.90	1.13	0.58	0.87
zrd6	1.53	1.42	1.01	1.19	1.46	1.87	0.95	1.37	1.17	1.48	0.77	1.11	0.88	1.10	0.57	0.84
zra5	1.19	1.10	0.71	0.88	1.01	1.50	0.46	0.91	0.70	0.99	0.28	0.61	0.40	0.67	0.10	0.37
zrb5	1.37	1.27	0.88	1.05	1.20	1.66	0.65	1.09	0.90	1.18	0.47	0.80	0.61	0.88	0.28	0.57
zrc5	1.58	1.46	1.06	1.24	1.28	1.74	0.69	1.15	0.96	1.25	0.50	0.85	0.66	0.94	0.30	0.62
zrd5	1.45	1.35	0.94	1.12	1.21	1.68	0.63	1.09	0.89	1.18	0.45	0.79	0.59	0.87	0.25	0.55
zra4	1.27	1.18	0.78	0.95	1.06	1.54	0.50	0.95	0.36	0.81	-0.14	0.28	0.00	0.24	-0.38	-0.09
zrb4	1.30	1.20	0.80	0.98	1.16	1.62	0.62	1.05	0.43	0.87	-0.07	0.35	0.07	0.31	-0.30	-0.01
zrc4	1.64	1.51	1.12	1.30	1.32	1.78	0.73	1.19	0.67	1.11	0.18	0.60	0.32	0.56	-0.06	0.24
zrd4	1.46	1.35	0.93	1.12	1.22	1.68	0.64	1.09	0.59	1.03	0.08	0.51	0.23	0.47	-0.15	0.14
zra3	1.45	1.35	0.95	1.13	1.18	1.65	0.61	1.06	0.46	0.90	-0.05	0.37	0.36	0.67	0.02	0.32
zrb3	1.08	1.02	0.62	0.80	0.86	1.36	0.32	0.77	0.08	0.54	-0.42	0.00	0.04	0.36	-0.29	0.01
zrc3	1.75	1.61	1.24	1.41	1.38	1.84	0.80	1.26	0.70	1.13	0.21	0.63	0.70	0.99	0.39	0.67
zrd3	1.35	1.26	0.83	1.02	1.10	1.58	0.52	0.98	0.41	0.86	-0.10	0.33	0.40	0.71	0.08	0.37
Min:	1.08	1.02	0.62	0.80	0.86	1.36	0.32	0.77	0.08	0.54	-0.42	0.00	0.00	0.24	-0.38	-0.09
Max:	1.75	1.61	1.24	1.41	1.49	1.91	0.98	1.40	1.20	1.51	0.81	1.14	0.90	1.13	0.62	0.87
Ave:	1.43	1.32	0.92	1.10	1.23	1.68	0.68	1.12	0.73	1.10	0.27	0.65	0.48	0.74	0.15	0.44
	6-lag:	Min:	0.62		**5-lag:**	Min:	0.32		**4-lag:**	Min:	-0.42		**3-lag:**	Min:	-0.38	
		Max:	1.75			Max:	1.91			Max:	1.51			Max:	1.13	
		Ave:	1.19			Ave:	1.18			Ave:	0.69			Ave:	0.45	

Table D-9
T-Scores for Recreation and Library Expenditues - Non-Metro Urban Group

Residential

	zra6	zrb6	zrc6	zrd6	zra5	zrb5	zrc5	zrd5	zra4	zrb4	zrc4	zrd4	zra3	zrb3	zrc3	zrd3
zca6	0.71	0.01	1.10	0.68	0.95	0.81	1.20	1.09	1.18	0.85	1.23	1.11	1.44	1.02	1.24	1.19
zcb6	0.57	-0.14	0.99	0.54	0.84	0.66	1.11	0.96	1.09	0.73	1.15	1.01	1.40	0.96	1.19	1.12
zcc6	0.86	0.18	1.14	0.77	1.09	0.97	1.24	1.18	1.27	1.00	1.24	1.19	1.48	1.11	1.21	1.22
zcd6	0.66	-0.04	1.00	0.59	0.91	0.76	1.11	1.01	1.12	0.82	1.12	1.04	1.38	0.98	1.13	1.10
zca5	0.83	0.16	1.18	0.79	1.93	1.30	2.36	1.99	2.31	1.96	2.46	2.33	2.55	2.15	2.46	2.40
zcb5	0.74	0.04	1.16	0.73	1.87	1.23	2.30	1.92	2.25	1.89	2.41	2.27	2.50	2.11	2.43	2.35
zcc5	0.95	0.28	1.22	0.86	1.90	1.28	2.31	1.95	2.28	1.93	2.41	2.29	2.51	2.12	2.40	2.35
zcd5	0.79	0.10	1.13	0.73	1.85	1.21	2.27	1.89	2.23	1.88	2.37	2.24	2.46	2.08	2.37	2.31
zca4	0.92	0.27	1.22	0.86	1.95	1.32	2.38	2.01	1.98	1.53	2.14	1.93	2.28	1.97	2.19	2.14
zcb4	0.97	0.28	1.34	0.95	2.01	1.37	2.43	2.07	2.02	1.54	2.20	1.97	2.34	2.01	2.27	2.20
zcc4	1.04	0.38	1.29	0.95	1.95	1.33	2.36	1.99	1.96	1.53	2.07	1.89	2.23	1.95	2.12	2.09
zcd4	0.96	0.28	1.27	0.89	1.94	1.31	2.37	2.00	1.95	1.49	2.09	1.88	2.24	1.94	2.15	2.10
zca3	0.99	0.36	1.23	0.89	1.91	1.31	2.33	1.96	1.99	1.56	2.12	1.93	2.49	1.98	2.47	2.29
zcb3	0.98	0.35	1.28	0.92	2.04	1.40	2.47	2.10	2.09	1.64	2.24	2.04	2.62	2.10	2.63	2.43
zcc3	1.12	0.47	1.34	1.01	1.97	1.37	2.37	2.01	2.00	1.58	2.10	1.93	2.49	1.99	2.45	2.28
zcd3	1.01	0.37	1.27	0.92	1.97	1.36	2.40	2.03	2.01	1.57	2.14	1.95	2.52	2.01	2.51	2.32
Min:	0.57	-0.14	0.99	0.54	0.84	0.66	1.11	0.96	1.09	0.73	1.12	1.01	1.38	0.96	1.13	1.10
Max:	1.12	0.47	1.34	1.01	2.04	1.40	2.47	2.10	2.31	1.96	2.46	2.33	2.62	2.15	2.63	2.43
Ave:	0.88	0.21	1.20	0.82	1.69	1.19	2.06	1.76	1.86	1.47	1.97	1.81	2.18	1.78	2.08	1.99

6-lag:	Min:	-0.14	**5-lag:**	Min:	0.66	**4-lag:**	Min:	0.73	**3-lag:**	Min:	0.96
	Max:	1.34		Max:	2.47		Max:	2.46		Max:	2.63
	Ave:	0.78		Ave:	1.68		Ave:	1.78		Ave:	2.01

Commercial/Industrial

	zca6	zcb6	zcc6	zcd6	zca5	zcb5	zcc5	zcd5	zca4	zcb4	zcc4	zcd4	zca3	zcb3	zcc3	zcd3
zra6	1.42	1.95	1.26	1.63	1.12	1.44	1.12	1.32	1.01	0.97	1.02	1.03	1.05	0.86	0.99	0.96
zrb6	1.83	2.31	1.64	2.01	1.55	1.83	1.49	1.71	1.43	1.37	1.38	1.42	1.43	1.31	1.33	1.35
zrc6	1.30	1.86	1.07	1.48	0.98	1.36	0.91	1.16	0.81	0.88	0.78	0.85	0.78	0.63	0.72	0.70
zrd6	1.44	1.97	1.24	1.63	1.14	1.47	1.09	1.32	1.00	1.00	0.97	1.02	1.00	0.85	0.92	0.92
zra5	1.33	1.88	1.17	1.55	0.33	0.65	0.44	0.56	0.27	0.23	0.38	0.32	0.41	0.10	0.41	0.27
zrb5	1.37	1.90	1.22	1.58	0.70	0.94	0.80	0.89	0.67	0.58	0.75	0.69	0.81	0.53	0.77	0.67
zrc5	1.30	1.85	1.05	1.47	0.17	0.57	0.13	0.35	0.02	0.12	0.02	0.07	0.04	-0.15	-0.01	-0.08
zrd5	1.25	1.80	1.04	1.44	0.28	0.62	0.32	0.48	0.19	0.20	0.24	0.23	0.29	0.03	0.25	0.15
zra4	1.27	1.84	1.09	1.48	0.18	0.56	0.25	0.41	1.04	1.19	1.13	1.18	0.99	0.76	1.07	0.94
zrb4	1.42	1.95	1.28	1.64	0.37	0.68	0.50	0.60	1.33	1.41	1.43	1.46	1.32	1.09	1.40	1.27
zrc4	1.34	1.89	1.08	1.51	0.19	0.60	0.11	0.36	1.01	1.21	1.02	1.13	0.90	0.74	0.93	0.85
zrd4	1.29	1.85	1.09	1.49	0.16	0.53	0.18	0.36	1.06	1.21	1.12	1.19	1.00	0.80	1.06	0.95
zra3	1.27	1.86	1.03	1.46	0.16	0.60	0.15	0.38	0.95	1.16	1.00	1.10	1.39	1.23	1.43	1.35
zrb3	1.41	1.96	1.23	1.61	0.30	0.68	0.38	0.54	1.09	1.24	1.18	1.24	1.70	1.50	1.74	1.65
zrc3	1.43	1.97	1.14	1.57	0.29	0.70	0.16	0.43	1.05	1.27	1.04	1.17	1.41	1.29	1.41	1.37
zrd3	1.35	1.91	1.11	1.53	0.20	0.61	0.17	0.40	1.00	1.19	1.04	1.14	1.48	1.31	1.50	1.43
Min:	1.25	1.80	1.03	1.44	0.16	0.53	0.11	0.35	0.02	0.12	0.02	0.07	0.04	-0.15	-0.01	-0.08
Max:	1.83	2.31	1.64	2.01	1.55	1.83	1.49	1.71	1.43	1.41	1.43	1.46	1.70	1.50	1.74	1.65
Ave:	1.38	1.92	1.17	1.57	0.51	0.87	0.51	0.70	0.87	0.95	0.91	0.95	1.00	0.81	1.00	0.92

6-lag:	Min:	1.03	**5-lag:**	Min:	0.11	**4-lag:**	Min:	0.02	**3-lag:**	Min:	-0.15
	Max:	2.31		Max:	1.83		Max:	1.46		Max:	1.74
	Ave:	1.51		Ave:	0.65		Ave:	0.92		Ave:	0.93

Table D-10
T-Scores for Recreation and Library Expenditues - Rural Group

Residential

	zra6	zrb6	zrc6	zrd6	zra5	zrb5	zrc5	zrd5	zra4	zrb4	zrc4	zrd4	zra3	zrb3	zrc3	zrd3
zca6	-2.38	-2.59	-2.24	-2.50	-1.96	-2.50	-2.12	-2.42	-1.67	-2.33	-1.94	-2.19	-1.41	-0.92	-1.75	-1.36
zcb6	-2.07	-2.34	-2.01	-2.22	-1.69	-2.29	-1.92	-2.16	-1.47	-1.99	-1.79	-1.93	-1.32	-0.83	-1.67	-1.26
zcc6	-1.98	-2.05	-2.07	-2.15	-1.73	-2.04	-2.00	-2.13	-1.56	-1.97	-1.87	-2.01	-1.38	-0.89	-1.72	-1.32
zcd6	-2.06	-2.22	-2.05	-2.22	-1.73	-2.18	-1.97	-2.17	-1.51	-2.02	-1.82	-1.99	-1.33	-0.83	-1.68	-1.27
zca5	-2.39	-2.52	-2.31	-2.53	-4.15	-4.67	-3.66	-4.40	-3.55	-4.49	-3.27	-4.00	-2.74	-2.80	-2.81	-2.90
zcb5	-2.22	-2.46	-2.09	-2.34	-4.09	-5.05	-3.51	-4.38	-3.38	-4.52	-3.12	-3.86	-2.60	-2.64	-2.69	-2.75
zcc5	-1.96	-2.02	-2.07	-2.13	-3.45	-3.71	-3.40	-3.77	-3.15	-3.64	-3.12	-3.55	-2.61	-2.56	-2.76	-2.76
zcd5	-2.08	-2.20	-2.09	-2.24	-3.92	-4.46	-3.56	-4.23	-3.38	-4.23	-3.19	-3.84	-2.66	-2.67	-2.76	-2.82
zca4	-2.25	-2.32	-2.29	-2.41	-3.83	-4.11	-3.58	-4.10	-2.24	-2.74	-2.14	-2.52	-1.76	-1.85	-1.87	-1.91
zcb4	-2.67	-2.85	-2.48	-2.78	-4.16	-4.77	-3.61	-4.40	-2.11	-2.73	-1.97	-2.39	-1.59	-1.71	-1.71	-1.75
zcc4	-1.93	-1.98	-2.06	-2.10	-3.27	-3.47	-3.30	-3.58	-2.06	-2.43	-2.09	-2.34	-1.69	-1.73	-1.87	-1.85
zcd4	-2.21	-2.29	-2.24	-2.37	-3.76	-4.10	-3.54	-4.06	-2.18	-2.70	-2.11	-2.48	-1.71	-1.80	-1.84	-1.87
zca3	-1.98	-2.02	-2.11	-2.15	-3.32	-3.50	-3.35	-3.62	-2.11	-2.47	-2.12	-2.38	-0.96	-1.11	-0.93	-1.04
zcb3	-2.17	-2.21	-2.26	-2.33	-3.80	-3.99	-3.64	-4.06	-2.35	-2.81	-2.25	-2.62	-1.04	-1.24	-0.98	-1.13
zcc3	-1.86	-1.91	-2.01	-2.03	-3.05	-3.22	-3.16	-3.35	-1.95	-2.25	-2.02	-2.21	-0.84	-0.97	-0.86	-0.93
zcd3	-1.97	-2.01	-2.10	-2.14	-3.40	-3.57	-3.41	-3.70	-2.18	-2.56	-2.18	-2.46	-0.99	-1.15	-0.96	-1.07
Min:	-2.67	-2.85	-2.48	-2.78	-4.16	-5.05	-3.66	-4.40	-3.55	-4.52	-3.27	-4.00	-2.74	-2.80	-2.81	-2.90
Max:	-1.86	-1.91	-2.01	-2.03	-1.69	-2.04	-1.92	-2.13	-1.47	-1.97	-1.79	-1.93	-0.84	-0.83	-0.86	-0.93
Ave:	-2.14	-2.25	-2.16	-2.29	-3.21	-3.60	-3.11	-3.53	-2.30	-2.87	-2.31	-2.67	-1.66	-1.61	-1.80	-1.75
	6-lag:	Min:	-2.85		**5-lag:**	Min:	-5.05		**4-lag:**	Min:	-4.52		**3-lag:**	Min:	-2.90	
		Max:	-1.86			Max:	-1.69			Max:	-1.47			Max:	-0.83	
		Ave:	-2.21			Ave:	-3.36			Ave:	-2.54			Ave:	-1.71	

Commercial/Industrial

	zca6	zcb6	zcc6	zcd6	zca5	zcb5	zcc5	zcd5	zca4	zcb4	zcc4	zcd4	zca3	zcb3	zcc3	zcd3
zra6	1.46	1.05	0.76	1.00	1.46	1.26	0.67	1.01	1.22	1.84	0.55	1.15	0.64	1.05	0.29	0.64
zrb6	1.72	1.43	0.83	1.21	1.59	1.58	0.71	1.15	1.26	2.03	0.57	1.22	0.64	1.05	0.29	0.64
zrc6	0.99	0.57	0.62	0.67	1.11	0.74	0.59	0.73	1.05	1.38	0.53	0.97	0.63	0.97	0.31	0.62
zrd6	1.45	1.06	0.81	1.04	1.47	1.24	0.73	1.04	1.26	1.82	0.61	1.19	0.69	1.10	0.34	0.69
zra5	1.02	0.58	0.55	0.64	3.07	3.00	2.14	2.78	2.66	3.09	1.85	2.57	1.94	2.64	1.47	2.06
zrb5	1.56	1.33	0.76	1.11	3.55	4.00	2.32	3.31	2.86	3.67	1.94	2.84	1.98	2.70	1.50	2.11
zrc5	0.80	0.38	0.52	0.51	2.27	2.04	1.87	2.12	2.16	2.20	1.70	2.09	1.78	2.24	1.45	1.89
zrd5	1.30	0.93	0.74	0.93	3.14	3.12	2.29	2.93	2.75	3.15	1.99	2.70	2.06	2.71	1.60	2.18
zra4	0.61	0.18	0.33	0.30	2.42	2.19	1.84	2.19	1.88	1.70	1.69	1.82	1.75	2.04	1.56	1.85
zrb4	1.38	0.89	0.74	0.91	3.38	3.42	2.27	3.06	2.32	2.29	1.97	2.27	2.01	2.43	1.76	2.14
zrc4	0.53	0.11	0.36	0.27	1.84	1.58	1.59	1.71	1.68	1.43	1.63	1.64	1.67	1.85	1.56	1.77
zrd4	1.02	0.56	0.63	0.67	2.72	2.52	2.08	2.50	2.07	1.90	1.88	2.03	1.92	2.22	1.73	2.04
zra3	0.17	-0.20	0.04	-0.08	1.54	1.28	1.31	1.40	1.45	1.21	1.39	1.38	1.39	1.49	1.30	1.44
zrb3	0.06	-0.29	-0.07	-0.18	1.80	1.56	1.42	1.61	1.56	1.36	1.44	1.49	1.50	1.63	1.38	1.55
zrc3	0.22	-0.18	0.14	0.00	1.32	1.07	1.23	1.23	1.41	1.15	1.43	1.37	1.37	1.44	1.31	1.42
zrd3	0.19	-0.19	0.08	-0.05	1.67	1.40	1.42	1.52	1.54	1.30	1.49	1.49	1.45	1.55	1.36	1.50
Min:	0.06	-0.29	-0.07	-0.18	1.11	0.74	0.59	0.73	1.05	1.15	0.53	0.97	0.63	0.97	0.29	0.62
Max:	1.72	1.43	0.83	1.21	3.55	4.00	2.32	3.31	2.86	3.67	1.99	2.84	2.06	2.71	1.76	2.18
Ave:	0.91	0.51	0.49	0.56	2.15	2.00	1.53	1.89	1.82	1.97	1.42	1.76	1.46	1.82	1.20	1.53
	6-lag:	Min:	-0.29		**5-lag:**	Min:	0.59		**4-lag:**	Min:	0.53		**3-lag:**	Min:	0.29	
		Max:	1.72			Max:	4.00			Max:	3.67			Max:	2.71	
		Ave:	0.62			Ave:	1.89			Ave:	1.74			Ave:	1.50	

Table D-11
T-Scores for Public Safety Expenditues - Atlanta Metro Using Three Data Points

Residential

	zra6	zrb6	zrc6	zrd6	zra5	zrb5	zrc5	zrd5	zra4	zrb4	zrc4	zrd4	zra3	zrb3	zrc3	zrd3
zca6	0.76	0.61	1.03	0.83	0.80	0.65	1.10	0.89	1.01	0.99	1.19	1.10	1.21	0.73	1.22	0.99
zcb6	0.78	0.63	1.06	0.86	0.82	0.67	1.13	0.92	1.03	1.01	1.22	1.14	1.24	0.75	1.26	1.02
zcc6	0.52	0.38	0.76	0.58	0.56	0.40	0.82	0.62	0.77	0.76	0.91	0.85	0.97	0.51	0.94	0.73
zcd6	0.63	0.48	0.88	0.69	0.67	0.51	0.95	0.74	0.88	0.86	1.04	0.96	1.08	0.61	1.07	0.85
zca5	0.70	0.56	0.97	0.77	0.85	0.62	1.34	1.00	1.11	0.78	1.49	1.17	1.44	1.09	1.66	1.40
zcb5	0.95	0.80	1.22	1.03	0.92	0.68	1.40	1.07	1.18	0.85	1.55	1.24	1.49	1.16	1.72	1.46
zcc5	0.49	0.35	0.72	0.54	0.76	0.53	1.24	0.91	1.02	0.68	1.39	1.07	1.36	1.02	1.57	1.31
zcd5	0.72	0.57	0.97	0.78	0.82	0.59	1.30	0.97	1.08	0.75	1.45	1.13	1.41	1.07	1.63	1.37
zca4	0.56	0.42	0.80	0.62	0.78	0.55	1.27	0.93	1.00	0.78	1.65	1.23	1.25	1.02	1.91	1.50
zcb4	0.70	0.55	0.96	0.77	1.00	0.79	1.48	1.15	0.90	0.66	1.56	1.13	1.16	0.91	1.83	1.41
zcc4	0.38	0.24	0.61	0.43	0.74	0.52	1.22	0.89	0.86	0.62	1.53	1.09	1.12	0.88	1.80	1.38
zcd4	0.54	0.39	0.78	0.60	0.87	0.65	1.35	1.02	0.86	0.63	1.54	1.10	1.13	0.88	1.81	1.38
zca3	0.49	0.34	0.70	0.53	0.56	0.33	1.07	0.72	1.04	0.82	1.69	1.27	0.51	0.36	0.66	0.52
zcb3	0.48	0.33	0.72	0.53	0.70	0.48	1.20	0.86	1.10	0.88	1.73	1.32	0.53	0.38	0.69	0.54
zcc3	0.29	0.15	0.50	0.33	0.66	0.43	1.14	0.81	0.86	0.62	1.53	1.09	0.52	0.38	0.69	0.53
zcd3	0.37	0.22	0.59	0.41	0.67	0.44	1.16	0.82	0.98	0.75	1.63	1.21	0.53	0.38	0.70	0.54
Min:	0.29	0.15	0.50	0.33	0.56	0.33	0.82	0.62	0.77	0.62	0.91	0.85	0.51	0.36	0.66	0.52
Max:	0.95	0.80	1.22	1.03	1.00	0.79	1.48	1.15	1.18	1.01	1.73	1.32	1.49	1.16	1.91	1.50
Ave:	0.59	0.44	0.83	0.64	0.76	0.55	1.20	0.90	0.98	0.78	1.44	1.13	1.06	0.76	1.32	1.06

6-lag:	Min:	0.15	**5-lag:**	Min:	0.33	**4-lag:**	Min:	0.62	**3-lag:**	Min:	0.36
	Max:	1.22		Max:	1.48		Max:	1.73		Max:	1.91
	Ave:	0.62		Ave:	0.85		Ave:	1.08		Ave:	1.05

Commercial/Industrial

	zca6	zcb6	zcc6	zcd6	zca5	zcb5	zcc5	zcd5	zca4	zcb4	zcc4	zcd4	zca3	zcb3	zcc3	zcd3
zra6	0.77	0.70	1.07	0.92	0.83	0.58	1.12	0.86	1.02	0.86	1.25	1.06	1.17	1.05	1.36	1.22
zrb6	0.87	0.80	1.18	1.03	0.94	0.67	1.23	0.96	1.12	0.96	1.36	1.16	1.27	1.16	1.48	1.34
zrc6	0.45	0.38	0.77	0.61	0.52	0.27	0.82	0.55	0.71	0.57	0.95	0.76	0.87	0.73	1.07	0.92
zrd6	0.65	0.58	0.96	0.80	0.72	0.46	1.01	0.74	0.91	0.75	1.14	0.95	1.06	0.93	1.26	1.12
zra5	0.75	0.69	1.06	0.90	1.13	0.92	1.30	1.14	1.25	1.02	1.37	1.20	1.44	1.34	1.47	1.42
zrb5	0.79	0.73	1.11	0.95	1.26	1.05	1.43	1.27	1.38	1.14	1.49	1.32	1.59	1.47	1.60	1.55
zrc5	0.39	0.31	0.70	0.54	0.95	0.73	1.11	0.95	1.06	0.88	1.17	1.03	1.22	1.15	1.27	1.21
zrd5	0.57	0.50	0.89	0.73	1.08	0.86	1.25	1.09	1.19	0.99	1.31	1.15	1.37	1.29	1.41	1.36
zra4	0.63	0.56	0.92	0.77	1.04	0.82	1.21	1.05	0.78	0.84	0.86	0.85	0.73	0.78	0.85	0.82
zrb4	0.66	0.59	0.95	0.80	1.10	0.88	1.28	1.12	0.94	1.00	1.03	1.03	0.89	0.92	1.03	0.98
zrc4	0.31	0.23	0.63	0.46	0.91	0.68	1.06	0.90	0.58	0.59	0.60	0.60	0.53	0.62	0.59	0.61
zrd4	0.46	0.39	0.76	0.60	0.97	0.74	1.14	0.97	0.74	0.77	0.79	0.79	0.69	0.75	0.79	0.77
zra3	0.45	0.38	0.74	0.59	1.02	0.80	1.18	1.02	0.66	0.71	0.72	0.72	-0.36	-0.38	-0.38	-0.39
zrb3	0.86	0.80	1.15	1.01	1.08	0.87	1.25	1.09	0.71	0.76	0.79	0.78	-0.27	-0.28	-0.29	-0.29
zrc3	0.25	0.17	0.57	0.40	0.90	0.67	1.04	0.89	0.50	0.50	0.50	0.50	-0.44	-0.48	-0.48	-0.49
zrd3	0.54	0.47	0.85	0.69	0.97	0.75	1.13	0.97	0.56	0.58	0.59	0.59	-0.35	-0.38	-0.38	-0.39
Min:	0.25	0.17	0.57	0.40	0.52	0.27	0.82	0.55	0.50	0.50	0.50	0.50	-0.44	-0.48	-0.48	-0.49
Max:	0.87	0.80	1.18	1.03	1.26	1.05	1.43	1.27	1.38	1.14	1.49	1.32	1.59	1.47	1.60	1.55
Ave:	0.59	0.52	0.89	0.74	0.96	0.73	1.16	0.97	0.88	0.81	1.00	0.91	0.71	0.67	0.79	0.74

6-lag:	Min:	0.17	**5-lag:**	Min:	0.27	**4-lag:**	Min:	0.50	**3-lag:**	Min:	-0.49
	Max:	1.18		Max:	1.43		Max:	1.49		Max:	1.60
	Ave:	0.68		Ave:	0.96		Ave:	0.90		Ave:	0.73

Table D-12
T-Scores for Recreation and Library Expenditues - Non-Metro Urban
Using Three Data Points

Residential

	zra6	zrb6	zrc6	zrd6	zra5	zrb5	zrc5	zrd5	zra4	zrb4	zrc4	zrd4	zra3	zrb3	zrc3	zrd3
zca6	0.71	0.01	1.10	0.68	0.95	0.81	1.20	1.09	1.18	0.85	1.23	1.11	1.44	1.02	1.24	1.19
zcb6	0.57	-0.14	0.99	0.54	0.84	0.66	1.11	0.96	1.09	0.73	1.15	1.01	1.40	0.96	1.19	1.12
zcc6	0.86	0.18	1.14	0.77	1.09	0.97	1.24	1.18	1.27	1.00	1.24	1.19	1.48	1.11	1.21	1.22
zcd6	0.66	-0.04	1.00	0.59	0.91	0.76	1.11	1.01	1.12	0.82	1.12	1.04	1.38	0.98	1.13	1.10
zca5	0.83	0.16	1.18	0.79	3.27	2.54	3.73	3.43	3.79	3.36	3.75	3.76	4.17	3.26	3.66	3.66
zcb5	0.74	0.04	1.16	0.73	3.28	2.59	3.71	3.43	3.77	3.37	3.73	3.74	4.13	3.26	3.64	3.64
zcc5	0.95	0.28	1.22	0.86	2.99	2.28	3.60	3.22	3.54	3.07	3.65	3.57	3.99	3.01	3.58	3.50
zcd5	0.79	0.10	1.13	0.73	3.14	2.43	3.68	3.35	3.68	3.23	3.71	3.68	4.08	3.15	3.63	3.59
zca4	0.92	0.27	1.22	0.86	3.03	2.29	3.57	3.22	-1.03	-0.23	-2.07	-1.30	-1.60	-1.17	-2.40	-1.94
zcb4	0.97	0.28	1.34	0.95	3.46	2.72	3.89	3.61	-1.32	-0.52	-2.32	-1.59	-1.85	-1.45	-2.62	-2.19
zcc4	1.04	0.38	1.29	0.95	2.92	2.22	3.55	3.15	-0.71	0.06	-1.80	-0.99	-1.31	-0.87	-2.15	-1.66
zcd4	0.96	0.28	1.27	0.89	3.18	2.45	3.75	3.40	-1.04	-0.24	-2.10	-1.32	-1.61	-1.18	-2.43	-1.97
zca3	0.99	0.36	1.23	0.89	2.54	1.85	3.12	2.72	-0.74	0.04	-1.82	-1.02	-0.76	-0.70	-1.08	-0.95
zcb3	0.98	0.35	1.28	0.92	3.02	2.30	3.53	3.19	-0.83	-0.04	-1.87	-1.10	-0.48	-0.48	-0.79	-0.68
zcc3	1.12	0.47	1.34	1.01	2.79	2.11	3.42	3.01	-0.51	0.24	-1.59	-0.78	-0.81	-0.77	-1.15	-1.02
zcd3	1.01	0.37	1.27	0.92	2.88	2.18	3.48	3.10	-0.66	0.12	-1.74	-0.94	-0.68	-0.66	-1.01	-0.89
Min:	0.57	-0.14	0.99	0.54	0.84	0.66	1.11	0.96	-1.32	-0.52	-2.32	-1.59	-1.85	-1.45	-2.62	-2.19
Max:	1.12	0.47	1.34	1.01	3.46	2.72	3.89	3.61	3.79	3.37	3.75	3.76	4.17	3.26	3.66	3.66
Ave:	0.88	0.21	1.20	0.82	2.52	1.95	2.98	2.69	0.79	0.99	0.27	0.63	0.81	0.59	0.35	0.48

6-lag:	Min:	-0.14	**5-lag:**	Min:	0.66	**4-lag:**	Min:	-2.32	**3-lag:**	Min:	-2.62
	Max:	1.34		Max:	3.89		Max:	3.79		Max:	4.17
	Ave:	0.78		Ave:	2.53		Ave:	0.67		Ave:	0.56

Commercial/Industrial

	zca6	zcb6	zcc6	zcd6	zca5	zcb5	zcc5	zcd5	zca4	zcb4	zcc4	zcd4	zca3	zcb3	zcc3	zcd3
zra6	1.42	1.95	1.26	1.63	1.12	1.44	1.12	1.32	1.01	0.97	1.02	1.03	1.05	0.86	0.99	0.96
zrb6	1.83	2.31	1.64	2.01	1.55	1.83	1.49	1.71	1.43	1.37	1.38	1.42	1.43	1.31	1.33	1.35
zrc6	1.30	1.86	1.07	1.48	0.98	1.36	0.91	1.16	0.81	0.88	0.78	0.85	0.78	0.63	0.72	0.70
zrd6	1.44	1.97	1.24	1.63	1.14	1.47	1.09	1.32	1.00	1.00	0.97	1.02	1.00	0.85	0.92	0.92
zra5	1.33	1.88	1.17	1.55	-1.40	-1.36	-0.91	-1.17	-1.03	-1.72	-0.77	-1.27	-0.20	-0.98	-0.48	-0.74
zrb5	1.37	1.90	1.22	1.58	-0.97	-1.01	-0.48	-0.77	-0.55	-1.27	-0.35	-0.81	0.28	-0.54	-0.09	-0.30
zrc5	1.30	1.85	1.05	1.47	-1.49	-1.39	-1.37	-1.43	-1.29	-1.75	-1.31	-1.59	-0.68	-1.17	-1.10	-1.18
zrd5	1.25	1.80	1.04	1.44	-1.48	-1.42	-1.18	-1.35	-1.18	-1.76	-1.07	-1.47	-0.43	-1.10	-0.81	-0.99
zra4	1.27	1.84	1.09	1.48	-1.61	-1.51	-1.20	-1.40	0.58	1.15	0.02	0.60	0.08	0.22	-0.34	-0.07
zrb4	1.42	1.95	1.28	1.64	-1.43	-1.40	-0.91	-1.19	0.13	0.73	-0.43	0.15	-0.37	-0.23	-0.77	-0.52
zrc4	1.34	1.89	1.08	1.51	-1.40	-1.30	-1.34	-1.36	1.12	1.62	0.66	1.17	0.66	0.75	0.32	0.55
zrd4	1.29	1.85	1.09	1.49	-1.58	-1.49	-1.32	-1.46	0.73	1.28	0.19	0.76	0.24	0.36	-0.16	0.10
zra3	1.27	1.86	1.03	1.46	-1.66	-1.52	-1.40	-1.52	0.85	1.37	0.33	0.87	2.06	1.66	2.14	1.94
zrb3	1.41	1.96	1.23	1.61	-1.24	-1.18	-0.79	-1.02	0.65	1.20	0.10	0.67	2.05	1.67	2.13	1.94
zrc3	1.43	1.97	1.14	1.57	-1.23	-1.14	-1.24	-1.23	1.23	1.71	0.82	1.30	2.23	1.80	2.32	2.11
zrd3	1.35	1.91	1.11	1.53	-1.40	-1.30	-1.20	-1.30	1.06	1.56	0.57	1.10	2.16	1.75	2.25	2.05
Min:	1.25	1.80	1.03	1.44	-1.66	-1.52	-1.40	-1.52	-1.29	-1.76	-1.31	-1.59	-0.68	-1.17	-1.10	-1.18
Max:	1.83	2.31	1.64	2.01	1.55	1.83	1.49	1.71	1.43	1.71	1.38	1.42	2.23	1.80	2.32	2.11
Ave:	1.38	1.92	1.17	1.57	-0.76	-0.62	-0.55	-0.61	0.41	0.52	0.18	0.36	0.77	0.49	0.59	0.55

6-lag:	Min:	1.03	**5-lag:**	Min:	-1.66	**4-lag:**	Min:	-1.76	**3-lag:**	Min:	-1.18
	Max:	2.31		Max:	1.83		Max:	1.71		Max:	2.32
	Ave:	1.51		Ave:	-0.63		Ave:	0.37		Ave:	0.60