

**AN ANALYSIS OF THE IMPACT OF CONVENTION CENTERS ON HOTEL  
OCCUPANCY TAX REVENUES IN TEXAS CITIES**

**By**

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## ABSTRACT

Cities across the nation, and the State of Texas, are subsidizing the construction of new convention centers or the expansion of existing convention facilities. Though the convention industry filters billions of dollars into the State, not every city is equipped to be a convention city. Cities that spend millions of dollars to construct or renovate a convention center may be making an investment that will show no returns. In this study multiple regression analysis is employed to evaluate the impact of convention centers on hotel occupancy tax revenues in 17 Texas cities. The evidence of the study indicates convention centers have an uncertain impact on tax revenues in the majority of cities studied. Four cities – Beaumont, Corpus Christi, Midland, and San Angelo – deviated from this trend.

## **-CHAPTER ONE- INTRODUCTION**

Visiting the United States in the early 19<sup>th</sup> century, French statesman Alexis de Tocqueville was struck by the gregarious nature of its inhabitants: "Americans of all ages, all stations of life, and all types of disposition," he wrote in his classic *Democracy in America*, "are forever forming associations." Nearly two centuries later, some 87,000 U.S. associations represent everything from retired Americans to hardware manufacturers to hand surgeons – and new ones form at the rate of 1,000 a year. The proliferation has fueled explosive growth in the meetings industry, now \$83 billion a year, and set off a high-stakes, nationwide race to build bigger better convention centers (The Baltimore Sun (Baltimore), 18 August 1996).

National and international conventions increased from 5145 to 9075 (76.4 percent) from 1965 to 1990 (Zelinsky 1994). "Conventions add more than \$75 billion a year to the U.S. economy and support more than 1.5 million jobs (Glasson 1994, 10)." In their study of the annual Association of American Geographer's (AAG) conferences, Randall and Warf (1996) estimated the AAG attendees funneled \$1.55 million, on average, into the economies of the thirteen cities where their conferences were held from 1983-1994. Convention centers are typically considered an invaluable means to attract this business, bringing substantial returns to the local economy in the form of expenditures on accommodations, local transportation, food and beverages, etc.(McGee 1993). "Convention centers can bolster shrinking tax bases. Even better, they provide the kind of revenue politicians like best: taxes paid by people who vote somewhere else (Economist 1997, 26)."

In order to realize the benefits of the convention business, cities throughout the nation and the State are constructing new or expanding and renovating existing

convention centers. “The magnitude of dollars involved in the convention industry has induced American cities to devote huge funds for construction of convention centers (Safavi 1971, 17).” By the end of 1998 the expansion of Chicago’s McCormick place will be complete. It will provide over 2 million square feet in exhibition space. San Antonio began renovating and expanding the Henry B. Gonzalez Convention Center in 1997. Smaller cities are getting into the act also. In early 1995, Charlotte, North Carolina opened its new facility that offers 276,800 square feet of exhibition space (Ghitelman 1995, 50). Hays County, Texas has approved a \$3 million renovation of its convention center located in San Marcos.

Despite the proliferation of new or reconstructed convention centers, not every city is equipped to be a convention city. Cities that spend millions of dollars to construct a convention may be making an investment that will show no returns. According to Robert Witherspoon, an economic planning consultant with Gladstone Associates in Washington D.C., “a convention center can only be effective as an economic development tool if there is a market (Knack 1982, 14).” Before cities commit themselves to millions of dollars of debt in order to build a convention center, cities should seriously evaluate the convention industry, their own resources, and risks involved in taking on a project of this magnitude.

## **RESEARCH PURPOSE**

The purpose of this research is to evaluate the economic impact convention centers have on seventeen cities throughout the State of Texas. Specifically, this study will measure the relationship between local hotel occupancy tax revenues and convention

centers. It is hoped that Texas cities can utilize this study as a tool in establishing and modifying economic development policies.

## **ORGANIZATION OF RESEARCH**

A comprehensive review of the literature related to convention centers is presented in Chapter Two. The history of convention centers, the attributes of a successful convention city, the benefits of convention centers, and the methods of financing convention centers will be discussed. In addition, this chapter presents the model utilized for this study and summarizes the research hypothesis. Chapter Three identifies the methodology used in this study – multiple regression analysis. The strengths and weaknesses of multiple regression are explained. In addition, there is a discussion of the sample, the dependent and independent variables, and how the variables are operationalized. The findings of this research are examined in Chapter Four. Results are presented in both narrative and tabular form. The relationship between the dependent variables and independent variable is analyzed and discussed. Finally, Chapter Five presents conclusions drawn from the analyses, limitations of this study, as well as recommendations for future research.

## **-CHAPTER TWO- LITERATURE REVIEW**

The purpose of this chapter is to review the literature available on convention centers. The history of convention centers and the elements of a successful convention city are discussed in this chapter. In addition, the benefits and various methods of conventions center are reviewed. Finally, this chapter presents the formal hypothesis which serves as the conceptual framework for the empirical portion of this study.

### **HISTORY OF CONVENTION CENTERS**

Conventions have been held ever since there were enough human beings to gather and discuss pertinent issues. The public assembly facilities of prehistoric times, however, were not the massive blocks of cement, steel, and glass that comprise the convention centers of the 20<sup>th</sup> Century. A cave most likely served as the first convention center. In ancient Greece political and religious leaders summoned their followers to smaller theatres to conduct debates and lectures (Jewell 1984, 3). Perhaps the best known facility in ancient times is Rome's Coliseum.

Teepees, log cabins, and later churches served as public assembly facilities in early America. As the United States labored to establish itself as a nation, a designated building where colonist gathered to discuss political and religious ideas and strategies to overcome the British served an important purpose. The State House in Philadelphia housed the United States' most famous convention – the Constitutional Convention- in 1787. The town hall served as the convention center of the 19<sup>th</sup> Century.

With both need and community pride as incentives the 19<sup>th</sup> Century saw the construction of hundreds of "town halls" throughout the land, most of which were designed to be all

things to all people. Often constructed with a low stage, a flat floor and portable seating this auditorium served as a theater, lecture and concert hall, arena for athletic events, voting place on election day, and drill room for the National Guard (Jewell 1984, 2).

Contemporary convention centers are a far cry from the town hall of the 19<sup>th</sup> Century.

Today, the majority of convention centers are built to attract the tax dollars of convention attendees and stimulate the economy.

As cities began losing a significant portion of their tax bases to the suburbs, core cities saw convention centers as a way to revitalize downtrodden downtown areas. "The contemporary convention city clearly has its roots in the downtown urban renewal and revitalization efforts of the 1950's and 1960's (Judd and Collins 1979, 192)."

Convention centers were seen as a means of creating a new source of revenue for core cities that could not be lost to suburban areas. Over time, the convention business outgrew the convention centers constructed in the 1950's and 1960's. In the 1970's and 1980's, major U.S. cities began developing new massive convention centers and expanding existing facilities (Graveline 1984, 2). Just after the boom in big cities there "came a renewed interest in medium-sized and smaller convention facilities for secondary or regional markets (Graveline 1984, 2)."

The 1990's have seen the continued expansion of centers in the traditional convention cities, such as Chicago and Las Vegas, and the construction of new facilities in smaller cities, such as Tampa and Portland. "The construction boom of convention centers has given many formerly 'unknown' locations the necessary meeting space to compete for medium-sized conventions (Oppermann and Chon 1997, 180)." By the end of 1998, 11 U.S. cities will provide over 1 million square feet of non-hotel exhibition

space, each, while 12 additional cities will each have over 500,000 square feet of exhibition space (Krieg, 1996, 14).”

## **WHAT MAKES A CONVENTION CITY**

As a result of the proliferation of convention centers, the competition to draw conventions is intense. The selection process for a convention site is complex and typically occurs three to four years before the convention takes place (Oppermann and Chon 1997, 181; 183). When a site selection committee searches for a convention site it evaluates a myriad of factors such as the size of the center, the services offered by the center and the city, hotel accommodations accessibility, affordability, and the attractiveness of the city.

### **Size**

The size of a convention center should be tailored to the segment of the convention market the city is attempting to attract. “Size is a key consideration for national conventions and trade shows (Graveline 1984, 3).” In an attempt to draw the nation’s largest conventions there is a contest to see who can build the bigger, better convention center. Cities in the hunt for the prize include Chicago, Orlando, Las Vegas, New York, Dallas, and Los Angeles. Table 2.1 demonstrates how convention centers in Chicago, Las Vegas, and Orlando have expanded over 1.7 million, 1.15 million, and 1 million square feet, respectively, since the time the centers were opened (Ghitelman 1995, 56). Chicago’s McCormick Place is the reigning champion with over 2 million square feet of exhibition space.

TABLE 2.1  
THE EXPANSIONS OF 3 MAJOR CONVENTION CENTERS

Exhibition Space (sq. ft. in thousands)	Las Vegas Convention Center	McCormick Place, Chicago	Orange County Convention Center, Orlando
2,000		1998	
1,900			
1,800			
1,700		1993	
1,600			
1,500		1986	
1,400	1992		
1,300			
1,200			
1,100		1980	1998
1,000		1977	
900	1983		
800	1982		1996
700		1971	
600	1977		
500			
400		1960 (opened)	1990
300	1973		1989
200	1967		1983 (opened)
100	1959 (opened)		

Source: David Ghitelman. "Convention Center Development: Never Enough?" *Meetings and Conventions* 30, no. 2 (February 1995): 48-45, table.

Despite this trend among the major convention cities to expand their facilities in exponential proportions, bigger is not always better. Although size is an important factor, "it may, however, be less essential to attracting convention business than people generally realize, for there are, in fact, many more small meetings than large ones (Loyacono 1991, 27-28)." In addition, convention space is growing faster than the convention business (Economist 1997, 29). There is not a demand for every city in the United States to construct a 1 million square foot convention center, such an investment would be a waste of tax payers money.

## **Services**

A convention center must also offer other qualities besides adequate exhibition space. As the competition to draw regional, national, and international conventions grows more fierce, convention centers need to be equipped with sophisticated technological capabilities – such as interpretation equipment for multi-lingual conventions, telecommunications technology, and multimedia technology (Baltimore Sun 1996; Graveline 1984, 4). The convention center itself should be staffed with a professional management team experienced with facility operations and promotion. In order to increase revenue some convention centers provide parking, exhibitor rental utilities, food and beverage services, etc. (Graveline 1984, 4). Providing these services is not a necessary function of a convention center, however, in most cities businesses in the private sector offer these services.

## **Hotel Space**

When evaluating a city as a possible convention site, a selection committee also takes into account the hotel accommodations offered by the city. David Peterson, managing director of the accounting firm Price Waterhouse, maintains that a plentitude of high-quality hotel rooms within walking distance of the convention center is the essential requirement for attracting professional associations (Ghitelman 1995, 58). As a rule of thumb, a city attempting to draw a major convention must have the capability of offering at least 1,000 rooms each night of the convention. If a city does not provide enough hotel rooms to accommodate the convention's delegation, it is likely the association's site selection committee will eliminate the city as a possible convention site. In conjunction

with adequate hotel accommodations, a city must offer a variety of restaurants and cafeterias.

### **Accessibility**

In addition to providing adequate accommodations, a city must also be accessible via major modes of transportation and have a good transit system within the city in order to draw large conventions. Convenience is a characteristic committees look for during the site selection process. The location of the airport in relation to the convention center and hotels is very important. It will reflect poorly on the city if convention attendees must travel an additional hour or two by automobile after stepping off an airplane. Aside from proximity, a city must provide transportation from the airport to the hotels and convention center.

The transportation needs of most trade shows and smaller conventions are different than the needs of larger conventions. Trade show and small convention attendees typically drive to conventions. Consequently, those cities catering to trade shows and smaller conventions need to have a large population of individuals within driving distance (Ghitelman 1995, 58). David Petersen states “trade associations can have anywhere from 30 to 40 percent drive-in attendance,” therefore, they are more concerned with the availability of parking space (Ghitelman 1995, 58 ).

### **Affordability**

A convention city must not only be accessible, it must also be affordable for associations, corporations, trade shows, and attendees. The majority of attendees

personally incur the costs of attending a convention. If the costs of hotel accommodations, food and beverages, and transportation for 3-4 days are unreasonable, attendance will be low. In the case of corporate meetings, price levels have an impact on the site selection process especially when a corporation is footing the bill for the convention and accommodations for employees. In some situations major hotel chains will alleviate expenditures by offering special rates to attendees and corporations.

The convention center itself must also be affordable. To stay competitive with other convention centers some centers have to make their facilities and services available at wholesale prices (Graveline 1984, 3).

### **That Something Extra**

Of course money isn't everything, people must want to travel to a city to attend a convention. "Record numbers of attendees descend upon more costly cities like New York and Washington to sample their cultural attractions, entertainment possibilities and myriad of activities, fine restaurants, and models of local transportation (Whigham-Desir 1995, 95)." For most convention delegates the appeal of travelling to a convention is not attending the convention itself but the fun they can have between meetings. After all, the purpose of drawing conventions is to have convention delegates spend money and boost the economy of the community.

Ruth Knack states a successful convention city possesses the three following elements:

- ✓ Plenty of hotel space,
- ✓ Good transportation in and out of the city,
- ✓ 'something unique' – some attraction to draw fickle conventioners (Knack 1982, 14).

Cities which lack extra amenities, such as the Riverwalk in San Antonio, the casinos in Las Vegas, and the amusement parks in Orlando, will have difficulties attracting major conventions. Amenities are important for towns attempting to attract smaller conventions, also. For example, the lure of sandy beaches and the Mexican-American border draw numerous regional conventions (and some national conventions) to South Padre Island, Texas. The attractiveness of a state, in general, can increase the appeal of a city. "One reason Texas is competitive nationally is because of the rich variety it offers (Glasson 1995, 11)."

In addition to appeal, Whigham-Desir states there is one intangible standard that a city must meet in order to be a great convention city – the city must value the association's, industry's, and/or company's business (1995, 95). "Through conventions a large number of potential repeat visitors become acquainted with a tourist area. If they are treated well and are pleased, they will not only advertise with word of mouth, but will also likely visit the area on other occasions (Abbey and Link 1994, 274)." If associations, industries, corporations, and delegates do not feel welcomed by the city, in general, it is highly unlikely they will bring the city repeat business and the city may be black balled by the convention industry.

## **BENEFITS OF CONVENTION CENTERS**

If a city possesses the traits of a successful convention city it can reap innumerable benefits. "Conventions whether small or large, are popular for a reason -- they send traveler's dollars through local economies. They augment other strategies for attracting visitors; they can be held at times of the year when tourists are in short supply

(Loyacono 1991, 27-28).” Convention centers can generate tourist dollars in ways other projects cannot (Loyacono 1991, 27). Charles Law asserts “ the average conference delegate spends approximately 2.0 to 2.5 times the amount spent by the ‘recreational tourist’ on a daily basis (Law 1992).

### **Primary Benefits**

Convention centers themselves do not produce a meaningful flow of revenue. In fact, the majority of convention centers do not produce enough revenue to finance operational costs and debt service (Glasson 1995, 10; Norton 1994, 39). However, cities do not construct convention centers to make money. Cities do not benefit from the money associations, corporations, and trade shows spend to rent the convention center; cities benefit from the money convention delegates spend before, after, and between convention meetings.

The purpose of constructing a convention center is to attract out-of-town business and generate economic activities throughout the city (Glasson 1995, 10). Norton maintains “their purpose is less to turn a profit than to boost economic growth in a downtown area partly by increasing tourism and creating jobs (1994, 39).” Local businesses, such as hotels, restaurants, and local transportation services, benefit most from convention delegate spending (Braun 1992, 34).

### **Secondary Benefits**

The benefits a convention center reaps extend beyond the initial dollars convention delegates pour into the economy. Secondary benefits include increased tax

revenues, employment, and development. As convention delegates inject new dollars into the local economy, state and local governments experience increases in tax revenues. Revenues gained indirectly from attendees' spending include state and local sales taxes, hotel occupancy taxes, food and beverage taxes, personal income taxes collected from individuals directly employed by industries serving visitors, and commercial property taxes from new developments associated with the tourist industry (Graveline 1984, 2).

New employment represents another benefit generated by convention centers. As economic activity and demand for services related to the tourist industry increases, new jobs are created.

The vast majority of these jobs occur in the hotel, restaurant, transportation, and service industries. These are generally located in the inner city, provide predominantly semi-skilled or unskilled work, and employ an unusually high ratio of minority personnel (Graveline 1984, 2).

In major cities where convention centers have been the anchor of downtown redevelopment, these types of employment opportunities are those most needed.

Spin-off development is another indirect benefit created by convention centers. When a major city erects a convention center in an area with a struggling economy, or a town constructs a center on the outside of town, city officials hope to stimulate reinvestment or growth in those respective areas. New convention facilities can induce new businesses to open, and existing businesses to expand.

Though there are significant differences between convention centers and professional sports arenas, both are often subsidized by local governments and intended to facilitate economic development. In 1990, Robert A. Baade and Richard F. Dye employed regression analysis to evaluate the impact of stadiums and professional sports

organizations on economic development in Standard Metropolitan Statistical Areas (SMSAs) throughout the United States. Baade and Dye utilized the following regression equation to measure the impact stadiums and professional sports organizations had on the real aggregate personal income in nine SMSAs (1990, 8):

$$Y_i = b_0 + b_1 \text{POP}_i + b_2 \text{STAD}_i + b_3 \text{FOOT}_i + b_4 \text{BASE}_i + b_5 \text{TREND}_i + E_i$$

Where,  $Y_i$  = the  $i^{\text{th}}$  SMSAs real aggregate personal income;

$\text{POP}_i$  = the  $i^{\text{th}}$  SMSAs population;

$\text{STAD}_i$  = a dummy variable which assumes a 0 value if the  $i^{\text{th}}$  SMSA renovates an old stadium or builds a new stadium; the value 1 is assigned after a stadium is renovated or built;

$\text{FOOT}_i$  = a dummy variable which assumes a 0 value if the  $i^{\text{th}}$  SMSA does not have a professional football team in a given period; the value 1 is assigned if it does;

$\text{BASE}_i$  = a dummy variable which assumes a 0 value if the  $i^{\text{th}}$  SMSA does not have a professional baseball team in a given period; the value 1 is assigned if it does;

$\text{TREND}_i$  = a variable assigned a value of 1 for 1965 and going up to 19 for 1983;

$E_i$  = stochastic error.

Baade and Dye include the population (POP) and time trend (TREND) variables, to minimize the bias created by the correlation of unknown determinants of personal income with the stadium and franchise variables (Baade and Dye 1990, 9). Their findings indicated that after controlling for the effect of population and the trend variable, the presence of a new or renovated stadium failed to achieve statistical significance on area income for all but one of the metropolitan areas studied (Baade and Dye 1990, 9-10).

In 1997, Michael Greenberg modified the regression model used by Baade and Dye to evaluate the impact professional sports facilities had on the sales tax revenues collected by 13 Metropolitan Statistical Areas (MSAs). Greenberg's model follows (1997, 38-39):

$$Y_i = b_1 + b_2 \text{RATE}_i + b_3 \text{POPULATION}_i + b_4 \text{STADIUM}_i + b_5 \text{ARENA}_i + b_6 \text{BALLPARK}_i + b_7 \text{TREND}_i + E_i$$

Where,  $Y_i$  = the  $i^{\text{th}}$  MSAs sales tax revenue generated for the years 1984-1996;

$\text{RATE}_i$  = a variable assigned the MSAs sales tax rate;

$\text{POPULATION}_i$  = the  $i^{\text{th}}$  MSAs population;

$\text{STADIUM}_i$  = a dummy variable which assumes a 0 value if the  $i^{\text{th}}$  SMSA renovates an old stadium or builds a new stadium; the value 1 is assigned after a stadium is renovated or built;

$\text{ARENA}_i$  = a dummy variable which assumes a 0 value before the  $i^{\text{th}}$  MSA renovates an old arena or built a new one; the value 1 is assigned after an arena is renovated or built;

$\text{BALLPARK}_i$  = a dummy variable which assumes a 0 value before the  $i^{\text{th}}$  MSA renovated an old ballpark or built a new one; the value 1 is assigned after a ballpark is renovated or built;

$\text{TREND}_i$  = a variable assigned a value of 1 for 1984 and going up to 19 for 1996;

$E_i$  = stochastic error.

Greenberg found that for the majority of the MSAs studied, the impact a new professional sports facility had on local area sales tax revenues failed to achieve statistical significance (Greenberg 1997, 46). Analyzing tax revenues is not the sole

technique for measuring the impact of tourist type expenditures, measurement of multipliers is another method used by researchers.

### **Multiplier Effect**

“Each dollar of convention-related spending initiates a broad set of economic interactions that produces additional spending in other sectors of a region’s economy (Braun 1992, 32).” Local businesses re-spend the money received from event attendees through payrolls, supplies, and services (Petersen 1996, 90). The impact tourist expenditures have as they ripple through the local economy is measured by multipliers. Petersen suggests a multiplier is how many times a dollar spent by an attendee is respent within the local economy (1996, 90). Michael Greenberg, maintains multipliers can be used to measure the amount of dollars flowing into an area (1997, 18).

According to Archer, “a multiplier is the ratio of direct, indirect, and induced changes within an economic system to the direct causal change itself (1976, 115).” Direct changes or expenditures involve the money convention attendees spend on goods and services. Indirect benefits include the money spent by hotels, restaurants, and retail stores to restock inventory, provide services for visitors, and replace machinery, taxes paid to the federal, state, and local government, and wages to employees (Archer 1976, 115). The money spent on goods and services, and taxes paid by employees of convention related businesses are induced benefits (Archer 1976, 116; Loyacono 1991, 12). Indirect and induced benefits are also known as secondary benefits.

Officials typically use multipliers to demonstrate the impact conventions have on income, employment, tax revenues, and spending within the local economy. However,

the use of multipliers to measure economic increases may sometimes be deceiving. “A problem with reports that use multipliers is the overstatement or even understatement of the multiplier (Greenberg 1997, 20).” To avoid an over- or under-exaggeration of a multiplier, Greenberg suggests using a simple rule of thumb – “a multiplier in a small area would be smaller than two while a multiplier in a large regional area would be larger than two (1997, 21).”

An area that is economically self-sufficient will have a high multiplier (Loyacono 1991, 21). In other words, revenue will leak out of the economy if the industries that produce goods and services associated with the convention business are not located in the area. “If all new income is respent on locally produced goods then the multiplier will be substantial (Baade and Dye 1990, 6).” The effects of money spent by convention delegates will diminish as convention-related businesses and employees purchase non-local goods and services (Randall and Warf 1996, 275). Major cities, such as Chicago and Dallas, which house industries that produce goods and services required by the convention business will enjoy a substantial multiplier. Smaller cities that must import these types of goods and services will have smaller multipliers. A study conducted by the Center for Economic Development at the University of Wisconsin at Milwaukee found that the average multiplier throughout the nation is two (Norton 1994, 39). In other words, for every dollar a convention delegate spends two dollars are generated for the local economy.

## **The Case of Orlando, Florida**

In 1992, the *Journal of Travel Research* published a study conducted by Bradley M. Braun. Braun examined the economic impact of conventions on the city of Orlando, Florida in 1989. He utilized a 494-sector input/output model of the regional economy to estimate the impact of spending “which arises from attending and holding a convention and that is done by delegates before and after a convention (Braun 1994, 32).” In 1989, delegate spending totaled \$1.044 billion in Orlando, averaging out to \$632.12 per delegate (Braun 1992, 33-34). Using the multiplier process Braun estimated the impact of convention spending increased to nearly \$3 billion in tangible economic activity (1992, 36). “Tourist spending by delegates before and after a convention contributed an additional \$443 million (Braun 1992, 36).” The presence of convention centers in Orlando was the impetus for this economic activity because without a convention center the conventions could not be held.

## **Intangible Benefits**

Economic benefits are not the only benefits to be gained from the presence of a convention center. A convention center “provides a forum for the exchange of ideas, information, and technology (Braun 1992, 33),” enhances a city’s reputation, and boosts civic pride.

‘Psychological health’ of a city is just as important as its fiscal condition. Thus, investment in cultural and recreational activities is a common and expected practice of municipal government (Johnson 1986, 423).

Chema suggests that in the future it will be important for cities to create opportunities for people to socialize within their borders (1996, 19). Convention centers can provide those opportunities.

### **They're Not For Every City**

Despite the benefits to be gained, a convention center will not be successful in every city. As stated earlier, if a city does not possess the infrastructure and unique amenities which attract conventions, the investment of public funds in the construction for a convention center would be misguided. Raphael Costes of Franklin, a money management firm, states “a lot of cities think these convention centers are a slam dunk, and they're not (Norton 1994, 39).”

In 1979, Judd and Collins expressed a concern that cities were making massive investments in convention centers based on insufficient information, scarce sampling, and sketchy feasibility studies (1979, 195). The proliferation of convention centers throughout the country and their continuous construction and expansion may justify Judd and Collins' concern. The convention business and convention space are not growing at the same rate. While there has been a 200% increase in exhibition space since the early 1980's, attendance at trade shows, conventions, and association meetings is hardly increasing (Krieg 1996, 15). As convention centers become more prolific it becomes less likely they will produce the economic benefits they are expected to produce (Baade and Dye 1990, 1). It is not uncommon to find two comparable cities located in roughly the same geographic area with comparable convention centers competing for the same

conventions. In reference to convention centers, the phrase “build it and they will come,” does not always ring true.

## **CONVENTION CENTER FINANCING**

When a city makes the decision to build a new convention center or expand an existing facility, there are several methods of financing to be considered. These methods include general obligation bonds, revenue bonds, municipal authorities or special tax districts, and intergovernmental agreements or loans.

### **General Obligation Bonds**

General obligation bonds, or full-faith and credit obligations, are debenture of a municipality backed by the full taxing power of the issuing community. “Full-faith and credit obligations ‘have an unlimited claim’ on the taxes (and other revenues) of the issuing unit (Mikesell 1995, 470).” Due to this security, general obligation bonds have lower interest rates. General obligation bonds must have the approval of the voters. The benefit of this type of financing is any surplus revenue from operations is paid into the community’s general fund, or reserved to pay for capital improvements (Petersen 1996, 103). The down side to general obligation bonds is that a convention center carrying a net operating deficit can place a heavy burden on a city’s general fund (Norton 1994, 40). “Regardless of the level of net operating income or deficit, the governmental unit is obligated to pay debt service from any and all available sources (Petersen 1996, 103).”

## Revenue Bonds

Though most capital improvement projects are financed by general obligation bonds, the same is not true for convention centers. The majority of convention centers are financed by revenue bonds. When the construction or expansion of a convention center is financed by a revenue bond, debt service is secured by a specific or earmarked revenue source. Earmarking is “the designation of certain revenue for specific purposes on a continuing basis (Fabricius and Snell 1990, xi).” Revenue bonds are non-guaranteed bonds. In other words, they are not guaranteed by the full faith and credit of the local government. Revenue sources include operating surpluses, hotel occupancy tax, sales tax and food and beverage tax. “In theory these taxes lay a center’s cost on conventioners and other travelers (Norton 1994, 40).”

Straight revenue, or self supporting, bonds are “those that are secured only by the revenues of the convention center (Norton 1994, 41).” As stated earlier, the majority of convention centers do not produce surplus, they generally have operating deficits. Those convention centers that do meet their operating budget typically do not produce enough revenue to cover operation costs and debt service (Graveline 1984, 3; Nortong 1994, 39). As a result, straight revenue bonds are frequently coupled with bonds secured by earmarked taxes or grants from other levels of government.

Another type of revenue that is frequently earmarked for financing convention centers is revenue collected by hotel occupancy taxes. The hotel occupancy tax is an ad valorem tax; that is, the tax paid by an individual is a designated percentage of the rental of a hotel room (Mikesell 1995, 325).

In Texas, the state hotel occupancy tax rate is currently “6 percent of the price paid for the room (Texas Comptroller of Public Accounts 1998).” As of 1994, this was the highest rate in the nation (Glasson 1994, 10). In 1997, collections were estimated to reach \$180 million (Texas Comptroller of Public Accounts 19998). In addition to the 6 percent charged by the State, “cities may charge up to 7 percent of the cost of a room; in combination with county portion, the maximum local tax is 9 percent (Glasson 1994, 10).” Table 2.2 shows how hotel occupancy tax rates in Texas cities compare with cities around the country. As the table indicates, the rates in Houston (15%) and San Antonio (15%) exceed the rates of such convention powerhouses such as Chicago (14.6%) and New York (14.2%). In the face of competition to draw conventions, cities must be wary of taxing themselves out of the market. Relatively high hotel occupancy taxes may scare off conventions (Mukherjee and Miara 1997).

**Table 2.2**  
**HOTEL OCCUPANCY TAX RATES**

<b>OUT-OF-STATE</b>			
Chicago	14.6%	Charlotte	12.0%
New York	14.2%	Pittsburgh	11.0%
Baltimore	14.0%	San Francisco	11.0%
Los Angeles	14.0%	San Diego	10.5%
Philadelphia	13.0%	Cincinnati	10.5%
Washington D.C.	12.5%	Boston	9.0%
<b>IN-STATE</b>			
Houston	15.0%	Austin	13.0%
San Antonio	15.0%	Dallas	13.0%
El Paso	14.5%	Fort Worth	13.0%

Source: Troy Glasson. “Drawing Delegates.” Fiscal Notes. Texas Comptroller Of Public Accounts, February 1995: 9-11, table “Bed” Tax Varies.

Convention centers are often financed by revenues produced by hotel occupancy taxes (Petersen 1996, 106). Louisville, Kentucky used a hotel/motel tax increase to fund

the majority of a project to double its downtown convention center (Tulsa World 1997, A1). In Texas, “the hotel/motel occupancy tax is the primary funding source of convention facilities and promotional activities (Glasson 1995, 10).” On May 2, 1998 Austin voters approved a 2 percent increase of the hotel occupancy to fund the expansion of the Austin Convention Center and improvements to Whaller Creek (the table above does not reflect the increase). Once debt service is retired, a Texas Department of Commerce survey shows that the majority of hotel occupancy tax revenue is used to support the local convention and visitors bureau and pay for the operation of the convention center (Glasson 1994, 10).

Revenues produced by sales, food, and beverage taxes can also be earmarked for the financing of a convention center. The justification for earmarking these revenue sources is that convention delegates spend a considerable amount of money at retail stores, restaurants, and bars while attending conventions; without the convention center this spending would not occur.

### **Special Tax Districts or Municipal or Regional Authorities**

Rather than dealing with finance issues in the political arena, some cities create special tax districts, or municipal or regional authorities. These public authorities are entities with public powers which exist outside the constraint of government (Mikesell 1995, 472). The functions of these authorities can vary. A special tax district can consist of the immediate area surrounding the convention center. Property, sales, hotel, and/or food and beverage taxes are unique to this district. A government can also form a municipal or regional authority to build convention centers and pay off bonds used to

finance the construction through user charges, revenue bonds, lease agreements with the city, or intergovernmental financing.

Finance plans that involve special tax districts and municipal authorities places the burden of financing the convention center on those who utilize the facility and those who reap spillover benefits of its presence in the area (Petersen 1996, 103; Swindell and Rosentraub 1998, 19). Special districts and authorities “also mean that taxpayers who do not want to help pay for the facilities could avoid all fees by simply never attending an event or buying anything within these very special districts (Swindell and Rosentraub 1998, 19).” These authorities also prevent individuals or groups who do not contribute to construction of the convention centers from reaping any spillover benefits.

### **Intergovernmental Agreements**

Because the benefits to be gained from convention centers can extend beyond the boundaries of a municipality, states and county governments are sometimes involved in financing the facility. “Recent studies have revealed that state governmental benefits from the tax revenue increases generated by convention centers are four to five times greater than local benefits (Petersen 1996, 104).” For instance, state governments are the primary benefactors of sales tax revenue increases, not local governments. “Retail sales taxes are the largest single source of state tax revenues in the United States (Mikesell 1995, 334).” According to Petersen, increased tax benefits are not the only factor which should compel states to share the responsibility for financing the development of convention centers. Convention delegates frequently travel to other areas of a state

before and/or after attending the convention, creating benefits that are enjoyed by that state and other municipalities (Petersen 1996, 106).

### **History of Convention Center Financing**

*In Building the Convention City: Politics, Finance, and Public Investment in Urban America*, by Heywood T. Sanders of Trinity University traces public investment in convention centers since the 1950's. Convention centers which were constructed during the urban revitalization era of the 1950s and 1960s were financed via general obligation bonds (Sander 1992, 139). Because general obligation bonds must be approved by voters, this allowed voters a direct voice in the development of conventions and required local officials to present the convention center financing package in an acceptable form (Sanders 1992, 139). As voters became less willing to approve general obligation bonds, public officials were forced to side-step voters by seeking alternative ways of financing convention centers such as taxing business (i.e. hotels, restaurants, and retail stores), lease arrangements, and the intervention of other government units (Sanders 1992, 154). As a result, "the bulk of new convention center financing now comes from public authorities outside the arena of public vote and review (Sanders 1992, 15)."

### **OVERVIEW**

Modern convention began as a part of the urban revitalization era that occurred between 1950s and 1960s. As the tourist and convention industries grew, and cities became aware of the benefits that could be gained from a convention center, cities across

the nation began investing in the development and expansion of convention centers. This trend has continued in the 1990s.

From Atlantic City to Anaheim, from Houston to Honolulu, from the great metropolises to middling cities, lawmakers see gold in the multimillion dollar concrete, steel and glass monoliths. Increasingly, they're viewed as downtown redevelopment anchors that will attract hordes of free-spending business travelers, pump millions into cash-hungry cities, fill hotel rooms, restaurants, shops, and tax coffers, create thousands of jobs and stimulate other development (Baltimore Sun 1996).

The development of a convention center will not be an ace-in-the-hole fore every city, however. To be a successful convention city, a city must provide adequate infrastructure and amenities. Cities that do not provide adequate exhibition space, hotel rooms, restaurants, and entertainment will have difficulties attracting conventions. In addition, cities must realize that the benefits of a convention center will not be immediate because associations typically book centers three to four years in advance. A municipality must be willing to invest a considerable amount of money in advertising initially to draw conventions down the road.

However, if a city possesses the characteristics of a successful convention city the returns on the city's initial investment can be innumerable. "[Convention centers] provide tangible economic benefits for the local economy and the resulting prosperity further enhances the city's reputation (Baade and Dye 1990, 1)."

## **CONCEPTUAL FRAMEWORK**

Throughout the literature researchers maintain convention centers provide the stimulus for economic growth. "The primary motive for the development of convention

centers is to attract non-residents whose spending will infuse new money into the economy and create new jobs, increased sales, and more tax revenues (Petersen 1996, 89).” Though statements such as this are prevalent in the literature, quantitative research on the economic impact of convention centers is lacking.

Analyzing taxes that are aimed at tourist is one way cities can measure the economic impact of convention centers. In Texas, municipalities can retain a larger portion of hotel occupancy tax revenues than sales tax revenues (the majority of sales tax revenues are collected by the state). Therefore, analyzing hotel occupancy tax revenues may be a better indicator, than sales tax revenues, of the economic impact of convention centers on the local economy of cities in Texas.

## **Model**

The model for this analysis has been adapted from the studies previously mentioned by Baade and Dye (1990) and Greenberg (1997). The models employed by Baade and Dye and Greenberg have been modified to fit the parameters of this study.

The model (hypthosis) for this analysis follows:

$$\text{REVENUE} = f(\text{CONVENTION CENTER [+], RATE [+], POPULATION [+], TREND [+]}).$$

Hotel occupancy tax revenue (REVENUE) is a function of the presence of a convention center (CONVENTION CENTER) in a city, the city’s hotel occupancy tax rate (RATE), a city’s population (POPULATION), and a time trend (TREND).

## **CONCLUSION**

This chapter provides an overview of the literature on convention centers and the convention center business, presents the conceptual framework for this study, and states the hypothesis tested. Chapter Three presents the methodology employed to test the hypothesis.

### **-CHAPTER THREE- METHODOLOGY**

This chapter examines the methodology used to test the hypothesis stated in Chapter Two. First, the sample and data sources are explained. Second, the independent and dependent variables are defined, and their operationalization discussed. Finally, the statistical method employed for this analysis is reviewed.

#### **SAMPLE**

This research examines the hotel occupancy tax revenues collected between 1975 and 1997 of seventeen cities with convention or civic centers throughout the State of Texas. The population these cities were selected from includes 112 cities listed in the Texas Association of Conventions and Visitors Bureaus' July 1998 membership directory. The cities were selected using a non-probability sampling method known as judgmental or purposive sampling. Using this technique, the sample selected is based on the researcher's knowledge of the population and the purpose of the study (Babbie 1995, 225). The sample may be chosen for "convenience or on the basis of systematically employed criteria (Henry 1990, 17)."

For the purpose of this research, the cities included in the sample were selected on the basis of four criteria. First, the city must have a convention center which was built after 1975 and prior to 1998. Second, the city must levy a hotel occupancy tax. The third criterion involves the population of the city. In 1997, the population must not have exceeded 800,000. Finally, the information needed to perform the analysis must be available for the city to be selected.

TABLE 3.1  
CITIES

CITY	1997 POPULATION
Addison	11,574
Athens	12,129
Beaumont	115,798
Canton	3,446
Corpus Christi	276,111
Greenville	24,939
Longview	75,527
Lubbock	193,266
Lufkin	33,783
Marshall	25,205
Midland	99,013
New Braunfels	35,181
Paris	25,399
San Angelo	89,899
South Padre Island	2,233
Temple	51,005
Wichita Falls	98,705

## DATA SOURCES

Data for this research was collected from various sources. Hotel occupancy tax revenues for each city were obtained from the *Texas Local Hotel Tax Survey Reports* dating back to 1975. These reports are published by the Tourism Division of the Texas Department of Economic Development (formerly the Texas Department of Commerce). Information regarding cities convention center was obtained from each city's respective Chamber of Commerce, Conventions and Visitors Bureau, or convention center. Population counts for each city were collected from the Texas State Data Center at the University of Texas A&M and the U.S. Census. Using the population counts from the U.S. Census for 1970, 1980, and 1990 the researcher interpolated population estimates

for each city for 1975-1979 and 1981-1989.<sup>1</sup> A data matrix with all of the information used for this analysis is provided in Appendix B.

## **DEPENDENT VARIABLE**

The dependent, or criterion, variable for this study is the hotel occupancy tax revenues collected by each city. Local hotel occupancy tax revenues were compiled for each city for the years 1975 through 1997.<sup>2</sup> A number of cities did not levy a hotel occupancy tax for the full twenty-three year period. Years in which a city did not charge the tax were not included in the analysis.

## **INDEPENDENT VARIABLES**

For the purpose of this study there are four independent, or predictor, variables. A population variable is employed to control for population fluctuations in each city. A hotel occupancy tax rate variable is used to control for increases or decreases in a city's tax rate. A trend variable is factored into the equation in effort to minimize the impact of variables or influences not addressed in this study. A dummy variable (shown as Convention Center in Table 3.2) is utilized to indicate the presence or absence of a convention center.

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<sup>1</sup> The following formula was used for interpolation:  $\text{Future Value} = \text{Present Value} (1 + r)^n$ .

<sup>2</sup> Years cities did not collect hotel occupancy tax were assigned missing values. U.S. Census Data for 1970 was unavailable for South Padre Island. Therefore, hotel occupancy tax revenues for South Padre Island were only collected for 1980-1997.

## **OPERATIONALIZATION**

The hotel occupancy tax rate and population variables are ratio level variables and the actual figures are used in the analysis. In order to control for inflation, the Consumer Price Index is utilized to convert all local hotel occupancy tax revenues into constant dollars. The trend variable is assigned a value of 1 for 1975, 2 for 1976,...and twenty three for 1997. The convention center variable assumes a 0 (zero) value for the years prior to the construction of a convention center, and value of 1 (one) for the years following the construction. Table 3.2 provides a description of each variable, hypothesized relationships, and how they are operationalized.

TABLE 3.2  
OPERATIONALIZING THE CONCEPTUAL FRAMEWORK

VARIABLES	HYPOTHESIS	MEASUREMENT	DATA SOURCE
Dependent			
HOTEL OCCUPANCY TAX REVENUES		Yearly revenue figures for each city; figures have been converted to constant dollars using the Consumer Price Index	Texas Local Hotel Tax Survey Reports (1975-1997)
Independent			
POPULATION	+	Actual figures for each city	Texas State Data Center
CONVENTION CENTER	+	A value of 0 was assigned to the years prior to a city's convention center's construction. A value of 1 was recorded for the years following the construction	City Chambers of Commerce, Conventions and Visitors Bureaus, and convention centers
HOTEL OCCUPANCY TAX RATE	+	Actual figures for each city	Texas Local Hotel Tax Survey Report (1975-1997)
TREND	+	A value of 1 for 1975, 2 for 1976...23 for 1997	

## STATISTICAL METHOD

Multiple regression analysis is the inferential statistical techniques employed to test the hypothesis in this study. One aggregate regression and seventeen individual regressions are used to measure the variation of the hotel occupancy tax revenues of the seventeen cities studied. Multiple regression analysis provides a means of analyzing situations in which a dependent variable is simultaneously affected by several independent variables (Babbie 1995, 422). "The purpose of multiple regression analysis is to measure the relative importance of several predictor [independent] variables on one criterion [dependent] variable (Dileonardi and Curtis 1992, 108)." Multiple regression also allows researchers to measure the strength of each independent variable. In this study, the influence of a convention center, population, and hotel occupancy tax rates on hotel occupancy tax revenues is measured.

This statistical method has several strengths. Multiple regression is a good explanatory technique (DiLeonardi and Curtis 1992, 107). As mentioned above, multiple regression analysis allows researchers to measure the influence and strength of several predictor variables. In addition, this method allows for the evaluation of large amounts of data.

The output statistics calculated for this study include the multiple R, the  $R^2$ , the beta coefficients, the F ratio, and the t-statistic. The multiple R, or correlation coefficient, measures the correlation between the independent and dependent variables. The  $R^2$  expresses "what proportion of the variability of the dependent variable is explained by the regression model (Norusis, 403)." An  $R^2$  greater than .25 is worth reporting (DiLeonardi and Curtis 1992, 123). The beta coefficients measure the change

in dependent variables for every unit of change in an independent variable. It indicates that the variation in the dependent variable is explained by the variation in the independent variable (Mears 1994, 47). The F ratio indicates whether the  $R^2$  was achieved by chance. The greater the F ratio, the greater the likelihood that the variation of the dependent variable was a result of the regression model, and not achieved by chance (Mears 1994, 47; DiLeonardi and Curtis 1992, 135). The t-statistic for the regressions tests the null hypothesis that the independent variables have no impact on dependent variable. If the t-statistic is not significant, the influence of the independent variables cannot be distinguished from zero. SPSS was the statistical application used to calculate these statistics.

## CONCLUSION

This chapter presented the methodology used in this study. Multiple regression analysis is the statistical technique utilized to test the hypothesis in Chapter Two. The results of the eighteen regression analyses are presented in Chapter Three.

## **-CHAPTER FOUR - RESULTS**

This chapter reviews the results of the 18 regression analyses performed for this study. Results are presented in tabular and narrative form. Table 4.1 reveals the results of the aggregate regression. Table 4.2 displays the results of the regression for each individual city.

### **AGGREGATE REGRESSION**

As Table 4.1 indicates convention centers do not have a statistically significant impact on the local occupancy tax revenues of the cities included in this study. This finding is contrary to the predicted relationship between these two variables. The impact of the other independent variables on local hotel occupancy tax revenues, however, are statistically significant and consistent with the hypothesized relationships. The  $R^2$  for this regression is .40933, indicating forty one percent of the variation in the REVENUE variable can be attributed to variations in the POPULATION, RATE, and TREND variables. Appendix C presents a matrix of correlation coefficients for all of the variables in the model.

TABLE 4.1  
HOTEL OCCUPANCY TAX REVENUES  
(Aggregate Regression)

Independent Variables	Coefficients	t-statistics
1. Convention Center	-81669.69	-1.283 <sup>^</sup>
2. Rate	6449414.35	2.215 *
3. Population	4.94	12.143 **
4. Trend	22520.54	3.008 **
N= 346		
R = .63979		
R <sup>2</sup> = .40933		
F Ratio = 59.07761		

\*\* p < .01

\* p < .05

<sup>^</sup> not significant

## INDIVIDUAL REGRESSIONS

The aggregate regression analysis indicates convention centers do not have a statistically significant impact on the hotel occupancy tax revenues in the cities studied. However, when the cities are analyzed individually the results are different. Though the majority of cities reflect the findings of the aggregate regression, the revenues of five cities are significantly impacted by the presence of a convention center. As Table 4.2 indicates, convention centers in Addison, Beaumont, Corpus Christi, Midland, and San Angelo have a statistically significant impact on hotel tax revenues in their respective cities.

TABLE 4.2  
HOTEL OCCUPANCY TAX REVENUES  
(Individual Regressions)

	Independent Variables					Output Statistics			
	Convention Center	Rate	Trend	Population	Constant	R	R <sup>2</sup>	F-Ratio	N
<i>Positive Significant Impact - Convention Center Variable</i>									
Beaumont	123406.13 [2.007]*	4907696.5 [2.147]**	13929.15 [2.987]***	12.93 [.706]	-1382176.4 [-.629]	0.9377	0.87929	32.77877	23
Corpus Christi	223955.4 [1.736]*	27964377 [6.4]***	5827.7 [.059]	13.15 [.381]	-3141103.2 [-.422]	0.9879	0.9759	182.6524	23
Midland	209248.99 [4.306]***	-4518664 [-1.778]*	43534.43 [1.672]	-18.7 [-1.202]	1519386.3 [1.642]	0.89896	0.8084	16.84825	21
San Angelo	67952.92 [2.313]**	6275330.1 [5.848]***	21440.53 [1.329]	-21.51 [-1.331]	1405054.5 [1.309]	0.9586	0.91891	45.32817	21
<i>Negative Significant Impact - Convention Center Variable</i>									
Addison	-411073.99 [-2.391]**	-3732897.7 [-.553]	227163.76 [2.529]**	-103.3 [-.401]	-724986.42 [-.802]	0.9878	0.97574	120.6729	17
<i>Insignificant Statistical Impact - Convention Center Variable</i>									
Athens	-26179.56 [-1.646]	1200087.2 [2.563]**	-576.19 [-.163]	23.56 [.776]	-236508.64 [-.793]	0.86351	0.74564	12.46	22
Canton	1280.31 [.203]	700897.53 [2.675]*	733.09 [.320]	-0.25 [-.436]	-15506.08 [-.610]	0.98439	0.96902	23.46177	8
Greenville	-9289.7 [-.665]	2103088.7 [3.344]***	1133.24 [.510]	3.56 [.280]	-100497.55 [-.368]	0.94273	0.88874	31.95172	21
Longview	-58083.94 [-1.266]	437303.29 [.285]	16984.67 [4.796]***	0.54 [.312]	129747.34 [1.002]	0.94237	0.88805	33.71414	22
Lubbock	102337.98 [.691]	13370955 [3.289]***	41138.8 [1.131]	-17.58 [-.673]	2718236.2 [.648]	0.94266	0.8862	29.91742	20

\*\*\* P < .01

\*\* P < .05

\* P < .10

TABLE 4.2  
HOTEL OCCUPANCY TAX REVENUES  
(Individual Regressions)

	Independent Variables					Output Statistics			
	Convention Center	Rate	Trend	Population	Constant	R	R <sup>2</sup>	F-Ratio	N
<i>Insignificant Statistical Impact (cont.)</i>									
Lufkin	55673.62 [.252]	2365550.3 [2.563]**	-5463.36 [-.916]	25.91 [1.834]*	-654521.2 [-1.739]	0.95915	0.91996	45.97505	21
Marshall	-246585.6 [-.670]	-9232065 [-.502]	51223.3 [1.315]	346.96 [1.508]	-8096249.7 [-1.391]	0.62096	0.3856	2.66728	22
New Braunfels	-21975.61 [-.821]	4540784.8 [3.082]***	32.61 [.004]	32.17 [3.408]***	-714577.9 [-3.408]***	0.99216	0.98438	283.5382	23
Paris	-15768.91 [-1.372]	1194824.5 [3.209]***	3857.56 [3]***	-27.74 [-2.032]**	695610.12 [2.010]*	0.96635	0.93384	59.98447	22
South Padre Island	-75723.72 [-.351]	11784171 [2.201]**	-149872.22 [-.983]	2551.19 [1.391]	-1019975.2 [-2.295]**	0.95872	0.91914	36.94444	18
Temple	-1302.34 [-.021]	2930483.4 [1.451]	-5312.48 [-.721]	20.53 [1.629]	-746202.21 [.1481]	0.84964	0.72188	11.03116	22
Wichita Falls	-10824.95 [-.249]	2567796.1 [1.740]	11032.16 [1.879]*	-0.74 [-.044]	207363.28 [.132]	0.94061	0.88474	28.785	20

\*\*\* P < .01

\*\* P < .05

\* P < .10

### **Positive Significant Impact**

Beaumont most closely exhibits the relationships hypothesized between the dependent and independent variables. Each of the independent variables, save for POPULATION, has a significant positive impact on the dependent variable. The  $R^2$  value indicates 88 percent of the variation in the dependent variable is explained by variations in the independent variables.

In Corpus Christi, as well as San Angelo, only two independent variables exhibit the predicted relationships with dependent variable. For both cities, the convention center and tax rate have a significant and positive impact on local hotel occupancy tax revenues. The impact of the POPULATION and TREND variables are not statistically significant. The  $R^2$  values for each city were strong (Corpus Christi - .97596; San Angelo - .91891). The F-ratio for Corpus Christi (182.65240) indicates the variations in local hotel occupancy tax revenues are explained by the regression model.

In Midland, the relationship between the dependent and independent variables are unusual and unexpected. In Midland, both the convention center and tax rate have a statistically significant impact on hotel occupancy tax revenues. However, where the convention center has a positive impact on revenues, the tax rate has a negative impact on revenues. The relationships between the revenues and population, and revenues and trend are not statistically significant.

### **Negative Significant Impact**

Addison produced a more unusual and unexpected figure than Midland. The convention center has a significant negative impact on local hotel occupancy tax revenues. The TREND variable is also statistically significant, however the direction of the relationship is positive. The  $R^2$  value is .97574 and the F-ratio is 120.67294 indicating the regression model, rather than chance, explains the variation of the dependent variable.

In addition to the difference in the CONVENTION CENTER variable in the individual regressions, there are notable differences in the other independent variables. In the aggregate regression analysis the POPULATION and TREND variables have a positive significant impact on hotel occupancy tax revenues, however in the individual analyses these variables only achieve statistical significance in three and four cities, respectively. The RATE variable has a significant impact on the hotel occupancy tax revenues in twelve of the seventeen cities.

### **CONCLUSION**

This chapter reviewed the results of the regression analyses performed for this study. The results of the aggregate analysis revealed that convention centers do not impact local hotel occupancy tax revenues of cities studied. When analyzed individually, five cities contradicted this trend. Conclusions drawn from this study are discussed in Chapter Five.

## **- CHAPTER FIVE - THE FINAL CHAPTER**

This chapter summarizes this study and presents conclusions drawn from the results of the analyses. Also, suggestions for further research on convention centers are discussed.

### **RESEARCH SUMMARY**

The purpose of this research was to determine the impact of convention centers on local hotel occupancy tax revenues in seventeen Texas cities. Chapter Two presented a review of the literature on convention centers. A history of convention centers, the characteristics of a successful convention city, the benefits of convention centers, and the methods of financing convention centers were discussed. The conceptual framework and hypothesis were also presented in Chapter Two. The model utilized by Baade and Dye, and Greenberg to measure the impact of professional sports facilities on sales tax revenues in MSAs was adopted for this study. Convention centers were hypothesized to have a positive impact on local hotel occupancy tax revenues.

Chapter Three reviewed the research methodology used to test the hypothesis. Multiple regression analysis was the statistical technique employed in this research. Variables, variable measurements, and the operationalization of those variables were also identified in Chapter Three. The results of the regression analyses were presented in Chapter Four.

## MAJOR FINDINGS AND CONCLUSIONS

This study measured the impact of convention centers on the local hotel occupancy tax revenues of seventeen Texas cities. Table 5.1 presents a summary of the hypothesized and observed outcomes for the aggregate and individual regressions. The aggregate analysis showed that convention centers do not have a significant impact on hotel occupancy tax revenues in the cities studied. When the seventeen cities were analyzed individually, the results supported the notion that convention centers will not be beneficial for every city. In a majority of the cities, convention centers do not have a statistically significant impact on the hotel occupancy tax revenues collected. This may be attributed to the fact that the majority of the cities analyzed draw smaller conventions and trade shows, which typically have a sizable percentage of 'drive-in' attendance. In addition, hotel occupancy tax revenues may be negatively impacted by convention delegates who elect to stay in larger cities such as Dallas and San Antonio while attending conventions in cities such as Addison, Greenville, and New Braunfels. Surprisingly, the convention center at South Padre Island had an insignificant impact on hotel occupancy tax revenues despite hosting such national events as the Miss U.S.A. pageant.

Four cities contradicted the trend, however. The individual regression analyses found that convention centers in Beaumont, Corpus Christi, Midland, and San Angelo have a statistically significant positive impact on hotel occupancy tax revenues. Beaumont hosts several regional conventions, including the annual South Texas State Fair in early October that draws an estimated 600,000 people (Talley 1998, 30). Corpus Christi's location on the coast of the Gulf of Mexico, and numerous tourist attractions are

a natural draw for regional, national, and even international conventions. Midland's and San Angelo's distance from the remainder of the State almost necessitate an overnight stay when oil men, agriculturists, and educators travel to the area for conventions.

Despite the findings in these four cities, overall, the research indicates convention centers do not always generate an increase in hotel occupancy tax revenues.

### **Internal Invalidity**

In addition to the explanations given above, one could speculate that problems of internal invalidity could account for some of the unexpected outcomes in the regressions. "Internal invalidity refers to the possibility that the conclusions drawn from experimental results may not accurately reflect what has gone on in the experiment itself (Babbie 242)." One source of internal invalidity that may be present in this study is history. Natural boom and bust cycles in the economies of each of the cities studied (or perhaps throughout the State of Texas) may have negatively affected the regressions.

Another factor that may have negatively impacted the outcome of the regression could be demand elasticity. Elasticity of demand is a measure of the rate change in demand to the rate change in price (Kuntz 1996). In theory, the price of a product can only increase to a certain level before demand for the product is negatively impacted by the increase in price. In relation to the findings of this study, one may speculate that the demand for hotel rooms decreased as hotel occupancy tax rates increased (thereby affecting the hotel occupancy tax revenues).

Finally, as stated in the literature review conventions are typically booked three to five years in advance. One may speculate that there was a lag in effectiveness of

convention centers in cities such as Canton, Paris, South Padre Island, and Wichita Falls (whose convention centers were built toward the later part of the time frame used for this research).

TABLE 5.1  
SUMMARY OF OBSERVED IMPACT OF  
CONVENTION CENTERS

	Hypothesis	Observed
Aggregate Regression	+	(-)
Individual Regressions		
Addison	+	-
Athens	+	(-)
Beaumont	+	+
Canton	+	(+)
Corpus Christi	+	+
Greenville	+	(-)
Longview	+	(-)
Lubbock	+	(+)
Lufkin	+	(+)
Marshall	+	(-)
Midland	+	+
New Braunfels	+	(-)
Paris	+	(-)
San Angelo	+	+
South Padre Island	+	(-)
Temple	+	(-)
Wichita Falls	+	(-)

- +: positive significant impact
- : negative significant impact
- (+): positive insignificant impact
- (-): negative insignificant impact

## RECOMMENDATIONS FOR FURTHER RESEARCH

As cities continue to search for means of facilitating economic development, convention center research will serve as a valuable tool. Further analysis of the impact of convention centers on employment, personal income, and other form of tax revenues

should be conducted. Also, a study of the characteristics of the four cities whose hotel tax revenues were positively impacted by the presence of a convention center may offer guidance to cities contemplating an investment in a convention center. In addition, a review of the number of days each city's convention center was booked each year may be very informative. Finally, researchers should examine the intangible benefits a convention center brings to a city.

## CONCLUSION

In conclusion, this study provides an analysis of the impact convention centers have on the hotel occupancy tax revenues of seventeen Texas cities. The findings of this research confirmed the literature. Though convention centers can produce numerous benefits for city's that possess the amenities that attract conventions, convention centers will not be successful in every city. Convention centers did not have a statistically significant impact on the hotel tax revenues in a majority of the cities studied. Convention centers in four cities, however, proved to have a positive statistically significant impact on hotel occupancy tax revenues collected in each city. The weaknesses of this study include the inability to generalize the findings due to the sampling technique, and the abbreviated period of analysis for cities that did not levy a hotel occupancy tax until after 1975. Future research should include a more comprehensive look at the impact of convention centers on cities by examining additional economic measurements, such as sales tax revenues, and the intangible benefits, such as civic pride, realized by citizens.

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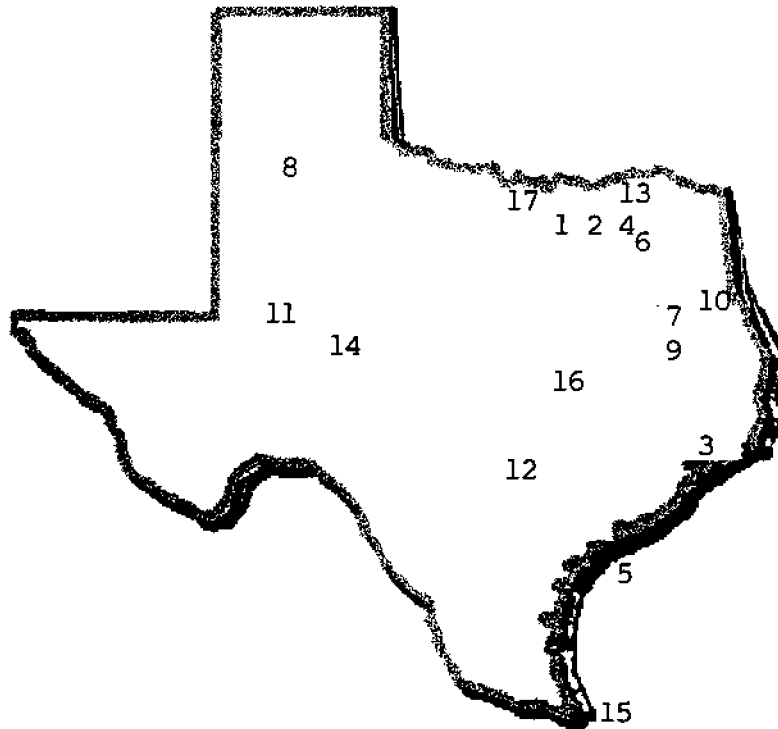
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## **APPENDIX A**

APPENDIX A  
MAP OF TEXAS



1. Addison
2. Athens
3. Beaumont
4. Canton
5. Corpus Christi
6. Greenville
7. Longview
8. Lubbock
9. Lufkin

10. Marshall
11. Midland
12. New Braunfels
13. Paris
14. San Angelo
15. South Padre Island
16. Temple
17. Wichita Falls

## **APPENDIX B**

<i>Addison</i>	Year	Adjusted Revenue	Tax Rate	Center	Population	Trend
	1975	0	0	0	1815	1
	1976	0	0	0	2270	2
	1977	0	0	0	2839	3
	1978	0	0	0	3550	4
	1979	0	0	0	4441	5
	1980	0	0	0	5553	6
	1981	116552.70	0.04	0	5813	7
	1982	126185.13	0.04	0	6086	8
	1983	609914.27	0.05	0	6372	9
	1984	600913.30	0.05	0	6670	10
	1985	996316.58	0.05	0	6983	11
	1986	1144006.30	0.05	0	7311	12
	1987	1155285.10	0.07	0	7654	13
	1988	1567506.90	0.07	0	8013	14
	1989	1594500.50	0.07	0	8388	15
	1990	1663935.10	0.07	0	8783	16
	1991	1702392.60	0.07	0	9068	17
	1992	1671451.00	0.07	1	9545	18
	1993	1825516.10	0.07	1	10336	19
	1994	1979606.90	0.07	1	10241	20
	1995	2232300.40	0.07	1	10579	21
	1996	2544309.50	0.07	1	10759	22
	1997	2792626.00	0.07	1	11574	23

*Athens*

	1975	0	0	0	9883	1
	1976	7405.75	0.02	0	9944	2
	1977	20084.82	0.03	0	10146	3
	1978	30339.73	0.03	0	10068	4
	1979	30466.26	0.03	0	10130	5
	1980	37903.14	0.03	0	10197	6
	1981	45492.34	0.03	0	10272	7
	1982	70135.74	0.04	0	10348	8
	1983	76148.76	0.04	0	10425	9
	1984	95507.06	0.07	0	10502	10
	1985	112739.94	0.07	0	10580	11
	1986	103865.62	0.07	0	10658	12
	1987	106463.28	0.07	0	10737	13
	1988	66091.21	0.07	0	10817	14
	1989	79058.56	0.07	0	10897	15
	1990	73477.78	0.07	0	10982	16
	1991	70472.81	0.07	1	11077	17
	1992	58333.36	0.07	1	11178	18
	1993	83601.21	0.07	1	11249	19
	1994	67726.8	0.07	1	11238	20
	1995	76893.7	0.07	1	11428	21
	1996	92491.5	0.07	1	11530	22
	1997	100119.99	0.07	1	12129	23

<i>Beaumont</i>	Year	Adjusted Revenue	Tax Rate	Center	Population	Trend
	1975	270480.78	0.03	0	117842	1
	1976	311695.31	0.03	0	117901	2
	1977	353009.68	0.04	0	117960	3
	1978	462719.15	0.04	0	118019	4
	1979	485938.02	0.04	1	118078	5
	1980	496152.54	0.04	1	118102	6
	1981	636840	0.04	1	117724	7
	1982	600300	0.04	1	117347	8
	1983	538428.45	0.07	1	116972	9
	1984	887098.14	0.07	1	116598	10
	1985	848092.7	0.07	1	116224	11
	1986	797249.86	0.07	1	115853	12
	1987	732566.56	0.07	1	115482	13
	1988	717710.87	0.07	1	115112	14
	1989	759286.93	0.07	1	114744	15
	1990	818772.8	0.07	1	114323	16
	1991	731064	0.07	1	116581	17
	1992	881332.88	0.07	1	118214	18
	1993	911204.15	0.07	1	118289	19
	1994	879115.95	0.07	1	116617	20
	1995	802125.97	0.07	1	115797	21
	1996	896262.4	0.07	1	115457	22
	1997	929523.74	0.07	1	115798	23

*Canton*

	1975	0	0	0	2549	1
	1976	0	0	0	2606	2
	1977	0	0	0	2664	3
	1978	0	0	0	2724	4
	1979	0	0	0	2784	5
	1980	0	0	0	2845	6
	1981	0	0	0	2855	7
	1982	0	0	0	2866	8
	1983	0	0	0	2876	9
	1984	0	0	0	2886	10
	1985	0	0	0	2897	11
	1986	0	0	0	2907	12
	1987	5025.68	0.02	0	2917	13
	1988	9875.36	0.02	0	2928	14
	1989	22681.54	0.04	0	2939	15
	1990	24043.97	0.04	0	2949	16
	1991	23240.64	0.04	0	11077	17
	1992	29029.08	0.05	0	11178	18
	1993	.	.	0	11249	19
	1994	35165.48	0.05	1	11238	20
	1995	30905.47	0.05	1	11428	21
	1996	.	.	1	11584	22
	1997	.	.	1	12129	23

**Corpus Christi**

Year	Adjusted Revenue	Tax Rate	Center	Population	Trend
1975	531164.63	0.03	0	217846	1
1976	603425.84	0.03	0	220613	2
1977	648167.48	0.03	0	223415	3
1978	898035.42	0.04	0	226252	4
1979	1011633.8	0.04	0	229125	5
1980	1079476.5	0.04	0	231999	6
1981	1220524.7	0.04	0	234435	7
1982	1360744.5	0.04	1	236897	8
1983	1420840.8	0.04	1	239384	9
1984	2343587.8	0.07	1	241898	10
1985	2474491.6	0.07	1	244437	11
1986	2386464.2	0.07	1	247004	12
1987	2720359.8	0.07	1	249598	13
1988	2218926	0.07	1	252218	14
1989	2160624.7	0.07	1	254867	15
1990	2379922.2	0.07	1	257453	16
1991	2463315	0.07	1	262092	17
1992	2707731.6	0.07	1	265300	18
1993	2658885.4	0.07	1	266958	19
1994	2686489.9	0.07	1	272399	20
1995	2760720.9	0.07	1	273620	21
1996	2875525.3	0.07	1	275100	22
1997	2910530.2	0.07	1	276111	23

**Greenville**

1975	25135.54	0.02	0	22098	1
1976	22103.06	0.02	0	22109	2
1977	27183.77	0.02	0	22120	3
1978	25143.18	0.02	0	22131	4
1979	39850.26	0.04	0	22142	5
1980	62020.89	0.04	0	22161	6
1981	76169.36	0.04	0	22250	7
1982	.	.	0	22339	8
1983	77631.2	0.04	0	22428	9
1984	71844.36	0.04	0	22518	10
1985	83507.94	0.04	0	22608	11
1986	94142.17	0.04	0	22698	12
1987	87090.96	0.04	1	22789	13
1988	81979.09	0.04	1	22880	14
1989	104910	0.05	1	22972	15
1990	99580	0.05	1	23071	16
1991	84216.22	0.05	1	23305	17
1992	88454.07	0.05	1	23474	18
1993	.	.	1	23636	19
1994	65103.75	0.05	1	23796	20
1995	146327.36	0.07	1	23986	21
1996	159673.54	0.07	1	24217	22
1997	162042.51	0.07	1	24939	23

*Longview*

Year	Adjusted Revenue	Tax Rate	Center	Population	Trend
1975	136041.62	0.03	0	53471	1
1976	158114.19	0.03	0	55214	2
1977	248202.53	0.03	0	57014	3
1978	238273.49	0.03	0	58873	4
1979	270624.9	0.04	0	60792	5
1980	292284.05	0.04	0	62762	6
1981	304838.84	0.04	0	63477	7
1982	379532.43	0.04	0	64201	8
1983	315354.23	0.04	1	64933	9
1984	299266.93	0.04	1	95673	10
1985	322745.41	0.07	1	66422	11
1986	379970.51	0.07	1	67179	12
1987	.	.	1	67945	13
1988	408364.2	0.07	1	68720	14
1989	435365.2	0.07	1	69503	15
1990	409771.7	0.07	1	70311	16
1991	316797.34	0.07	1	71598	17
1992	424075.29	0.07	1	72360	18
1993	453430.23	0.07	1	72438	19
1994	471127.05	0.07	1	73434	20
1995	493889.94	0.07	1	73939	21
1996	530275.61	0.07	1	74758	22
1997	547690.14	0.07	1	75227	23

*Lubbock*

1975	316745.72	0.03	0	161099	1
1976	386134.2	0.03	0	163613	2
1977	424986.88	0.04	0	166165	3
1978	621478.78	0.04	1	168757	4
1979	585175.2	0.04	1	171390	5
1980	593536.01	0.04	1	173979	6
1981	558429.62	0.04	1	175162	7
1982	649080.59	0.04	1	176353	8
1983	648478.62	0.04	1	177552	9
1984	350912.99	0.05	1	178760	10
1985	1267850.3	0.07	1	179975	11
1986	992981.54	0.07	1	181199	12
1987	975936.72	0.07	1	182431	13
1988	1123267.2	0.07	1	183672	14
1989	.	.	1	184921	15
1990	.	.	1	186206	16
1991	1086320	0.07	1	188789	17
1992	1096240.4	0.07	1	191523	18
1993	.	.	1	193194	19
1994	1258385	0.07	1	194286	20
1995	1213927.3	0.07	1	194349	21
1996	1325511.4	0.07	1	194188	22
1997	1285747.5	0.07	1	193266	23

**Lufkin**

Year	Adjusted Revenue	Tax Rate	Center	Population	Trend
1975	75858.35	0.03	0	25661	1
1976	99686.91	0.03	1	26218	2
1977	98756.96	0.03	1	26786	3
1978	92073.2	0.03	1	27368	4
1979	138901.14	0.03	1	27962	5
1980	128350.17	0.03	1	28562	6
1981	142274.45	0.04	1	28722	7
1982	115571.2	0.04	1	28883	8
1983	160386.72	0.04	1	29045	9
1984	186390.76	0.06	1	29207	10
1985	232076.1	0.06	1	29371	11
1986	207279.3	0.06	1	29535	12
1987	.	.	1	29701	13
1988	208028.86	0.06	1	29867	14
1989	201414.29	0.07	1	30034	15
1990	209010.76	0.07	1	30206	16
1991	197107.63	0.07	1	30791	17
1992	213692.52	0.07	1	31386	18
1993	232196.45	0.07	1	31651	19
1994	235801.13	0.07	1	31930	20
1995	258227.18	0.07	1	32522	21
1996	.	.	1	32574	22
1997	271862.18	0.07	1	33783	23

**Marshall**

1975	31123.38	0.03	0	23905	1
1976	33105.39	0.03	0	24103	2
1977	56935.02	0.03	1	24303	3
1978	99357.86	0.04	1	24505	4
1979	116680.38	0.04	1	24708	5
1980	123403.91	0.04	1	24921	6
1981	133661.74	0.04	1	24794	7
1982	155595.69	0.04	1	24667	8
1983	133807.22	0.06	1	24542	9
1984	182945.57	0.06	1	24416	10
1985	182352.93	0.06	1	24292	11
1986	.	.	1	24168	12
1987	162762.16	0.06	1	24045	13
1988	159285.73	0.06	1	23922	14
1989	170158.37	0.07	1	23800	15
1990	171775.5	0.07	1	23682	16
1991	170625.64	0.07	1	24096	17
1992	174681.44	0.07	1	24304	18
1993	165140.26	0.07	1	24471	19
1994	186094.8	0.07	1	24061	20
1995	253704.72	0.07	1	24064	21
1996	215439.84	0.07	1	25473	22
1997	2200763.4	0.07	1	25205	23

**Midland**

Year	Adjusted Revenue	Tax Rate	Center	Population	Trend
1975	0	0	0	64756	1
1976	176128.71	0.03	0	65870	2
1977	233513.24	0.04	0	67003	3
1978	217945.38	0.04	0	68455	4
1979	320411.16	0.04	0	69327	5
1980	392513.04	0.04	1	70525	6
1981	560140.31	0.04	1	72218	7
1982	615164.67	0.04	1	73951	8
1983	426388.34	0.05	1	75726	9
1984	426084.34	0.06	1	77543	10
1985	371200	0.06	1	79404	11
1986	537344.32	0.06	1	81310	12
1987	.	.	1	83261	13
1988	449852.04	0.07	1	85259	14
1989	451023.42	0.07	1	87306	15
1990	440003.42	0.07	1	89443	16
1991	459663.83	0.07	1	92005	17
1992	455680.44	0.07	1	92994	18
1993	458874.2	0.07	1	95003	19
1994	458582.85	0.07	1	96462	20
1995	500643.46	0.07	1	97623	21
1996	519890.25	0.07	1	97549	22
1997	551452.14	0.07	1	99013	23

**New Braunfels**

1975	66697.2	0.03	0	20000	1
1976	78149.6	0.03	0	20458	2
1977	84258.95	0.03	1	20923	3
1978	132263.69	0.04	1	21405	4
1979	142127.58	0.04	1	21896	5
1980	175360.95	0.04	1	22402	6
1981	201291.95	0.04	1	22852	7
1982	198727.25	0.04	1	23312	8
1983	218489.51	0.04	1	23780	9
1984	192546.92	0.04	1	24258	10
1985	352023.81	0.06	1	24746	11
1986	351682.12	0.06	1	25243	12
1987	325240.96	0.06	1	25751	13
1988	352446.98	0.06	1	26268	14
1989	407891.69	0.07	1	26796	15
1990	450454.73	0.07	1	27334	16
1991	495786.91	0.07	1	28686	17
1992	561511.03	0.07	1	29073	18
1993	602786.67	0.07	1	30402	19
1994	624115.8	0.07	1	31347	20
1995	647498.9	0.07	1	32252	21
1996	630178.78	0.07	1	34240	22
1997	707257.88	0.07	1	35181	23

**Paris**

Year	Adjusted Revenue	Tax Rate	Center	Population	Trend
1975	0	0	0	24442	1
1976	51265.75	0.03	0	24648	2
1977	47232.31	0.03	0	24855	3
1978	49024	0.03	0	25063	4
1979	55489.8	0.03	0	25274	5
1980	52303.32	0.03	0	25498	6
1981	63898.11	0.03	0	25427	7
1982	65773.22	0.04	0	25355	8
1983	78637.21	0.05	0	25284	9
1984	89916.93	0.07	0	25214	10
1985	141163.65	0.07	0	25143	11
1986	134174.48	0.07	0	25073	12
1987	148456	0.07	0	25002	13
1988	162339.79	0.07	0	24932	14
1989	156509.58	0.07	0	24863	15
1990	159292.76	0.07	0	24799	16
1991	140690.18	0.07	0	24965	17
1992	141257.42	0.07	0	25168	18
1993	142686.94	0.07	0	25063	19
1994	143771.63	0.07	1	24907	20
1995	137799.36	0.07	1	25257	21
1996	152927.32	0.07	1	25215	22
1997	155401.95	0.07	1	25399	23

**San Angelo**

1975	0	0	0	68415	1
1976	147254.17	0.03	0	69359	2
1977	204344.08	0.04	0	70317	3
1978	277903.27	0.04	1	71287	4
1979	217984.8	0.04	1	72271	5
1980	269499.15	0.04	1	73240	6
1981	304438.07	0.04	1	74295	7
1982	333758.52	0.04	1	75365	8
1983	315738.38	0.055	1	76450	9
1984	443039.26	0.07	1	77551	10
1985	511146.11	0.07	1	78667	11
1986	453106.21	0.07	1	79800	12
1987	.	.	1	80949	13
1988	458202.06	0.07	1	82115	14
1989	473937.38	0.07	1	83297	15
1990	414085.05	0.07	1	84462	16
1991	425918.91	0.07	1	85778	17
1992	412634.49	0.07	1	86591	18
1993	425090.76	0.07	1	87980	19
1994	428697.9	0.07	1	87588	20
1995	481370.18	0.07	1	88774	21
1996	462072.14	0.07	1	89567	22
1997	480890.14	0.07	1	89899	23

<i>South Padre Island</i>	Year	Adjusted Revenue	Tax Rate	Center	Population	Trend
	1975					1
	1976					2
	1977					3
	1978					4
	1979					5
	1980	543355.29	0.04	0	791	6
	1981	496267.45	0.04	0	853	7
	1982	715368.2	0.04	0	919	8
	1983	802400	0.07	0	991	9
	1984	680085.29	0.04	0	1068	10
	1985	767325.15	0.04	0	1152	11
	1986	843905.99	0.04	0	1241	12
	1987	853838.48	0.04	0	1338	13
	1988	1422005	0.07	0	1443	14
	1989	1694700	0.07	0	1555	15
	1990	1662491.2	0.07	0	1677	16
	1991	1637750	0.07	1	1796	17
	1992	2311730	0.07	1	1852	18
	1993	1728384.2	0.07	1	1962	19
	1994	1927405.8	0.07	1	2028	20
	1995	1808704.2	0.07	1	2107	21
	1996	1869631.6	0.07	1	2178	22
	1997	1953246.7	0.07	1	2233	23

*Temple*

	1975	127728.17	0.03	0	37677	1
	1976	130534.56	0.03	0	38589	2
	1977	141738.15	0.04	0	39522	3
	1978	205320.17	0.04	0	40479	4
	1979	185694.18	0.04	0	41458	5
	1980	202484.61	0.04	0	42474	6
	1981	207840.42	0.04	0	42827	7
	1982	205652.43	0.04	1	43182	8
	1983	209856.69	0.07	1	43540	9
	1984	323562.93	0.07	1	43902	10
	1985	482258.4	0.07	1	44266	11
	1986	328308.41	0.07	1	44634	12
	1987	.	.	1	45004	13
	1988	279782.35	0.07	1	45378	14
	1989	244901.1	0.07	1	45754	15
	1990	279619.11	0.07	1	46150	16
	1991	283401.07	0.07	1	43787	17
	1992	295689.66	0.07	1	46413	18
	1993	319541.38	0.07	1	47251	19
	1994	345772.13	0.07	1	49079	20
	1995	382969.52	0.07	1	49489	21
	1996	413055.24	0.07	1	50097	22
	1997	382631.14	0.07	1	51005	23

**Wichita Falls**

Year	Adjusted Revenue	Tax Rate	Center	Population	Trend
1975	0	0	0	95211	1
1976	0	0	0	95001	2
1977	0	0	0	94792	3
1978	229800	0.04	0	94584	4
1979	366838.5	0.04	0	94376	5
1980	305608.95	0.04	0	94201	6
1981	298941.48	0.04	0	94408	7
1982	356979.78	0.04	0	94616	8
1983	318494.63	0.04	0	94824	9
1984	333792.78	0.04	0	95033	10
1985	371947.97	0.06	0	95242	11
1986	502391.95	0.06	0	95451	12
1987	444707.12	0.07	0	95661	13
1988	502099.31	0.07	0	95872	14
1989	478567.95	0.07	0	96083	15
1990	451880.25	0.07	0	96259	16
1991	522166.13	0.07	0	97710	17
1992	477559.56	0.07	0	97819	18
1993	519146.01	0.07	0	98356	19
1994	556713	0.07	0	97322	20
1995	559226.22	0.07	0	98107	21
1996	557606.9	0.07	1	100501	22
1997	547548.44	0.07	1	98705	23

## **APPENDIX C**

Coefficient Correlation  
for Aggregate Regression

	MEAN	ST. DEV.	REVENUE	RATE	TREND	CENTER	POPULATION
REVENUE	541426.7330	628536.2810	1.0000	0.3879 0.000	0.3420 0.000	0.2298 0.000	0.5320 0.000
RATE	0.0550	0.0160		1.0000	0.8281 0.000	0.4758 0.000	0.1090 0.021
TREND	12.5090	6.4700			1.0000	0.4869 0.000	0.0020 0.000
CENTER	0.624	0.485				1.0000	0.1900 0.000
POPULATION	66605.208	66761.074					1.000