

Factors that Influence the Size of Tax Increment Financing Districts in Texas

By

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Abstract: *Tax Increment Financing (TIF) is a popular method employed by city governments to spur economic development and fund necessary improvements to infrastructure. Developed in California in 1952, TIF or Tax Increment Reinvestment Zone (TIRZ) as it is known in Texas was originally proposed as a solution to redevelop blighted urban areas where private sector initiative was absent. Since its first use, TIF has become increasingly popular and municipalities across the country have established TIF districts.*

Yet, the requirements that define appropriate use of TIF vary from state to state, and in states like Texas have been interpreted very broadly. Furthermore, little effort has been made to study TIF development in Texas as much of the literature focuses primarily on states in the Great Lakes region. Utilizing data provided by the TIF Registry maintained by the Texas Comptroller, this explanatory research uses multiple regression analysis to determine if factors that influence TIF adoption identified in the current body of literature also influence the size in acres of TIF districts adopted by municipalities in Texas. The four factors in this study are: (1) economic stress as measured by the county unemployment rate; (2) competitive adoption as measured by the number of neighboring TIF-adopting municipalities; (3) revenue capture as measured by the number of participating overlapping jurisdictions; and (4) path dependency as measured by whether or not the municipality has previously adopted TIF districts in the past.

This research found that the county unemployment rate in the year of TIF adoption and neighboring TIF-adopters (i.e. competitive adoption) had a positive effect on TIF size. Path dependency had a negative effect on the size of TIF districts established by Texas municipalities. The number of overlapping jurisdictions participating was not statistically significant.

About the Author

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Chapter One: Research Purpose

Introduction

Local governments possess a wide range of tools to promote economic development. The importance of a stable, healthy economic base cannot be overemphasized as a robust local economy is critical in ensuring a stable, adequate tax base. Yet, strategies employed by local government leaders vary within the wider contexts of a given city's fiscal health and prevailing voter sentiment. Since first adoption, tax increment financing, or *TIF* has become one of the most common means of financing local economic development. Despite the prevalence of TIF, it is little understood by voters and often misunderstood by decision makers. This chapter familiarizes the reader on how TIF works theoretically, explains why TIF is so popular, and articulates the benefits and criticisms of TIF, which serve as the foundation for the review of the literature. The chapter ends with the purpose of this research. Chapter Two looks at TIF and how it is applied in Texas specifically and explains the unique conditions that make the study of TIF in Texas academically valuable.

Tax Increment Financing Explained

A TIF is both a special purpose district and at the same time a financing mechanism by which cities fund projects to stimulate economic development. The conditions under which a TIF may be created vary from state to state; the parameters of which are defined by each state's TIF enabling legislation. Traditionally, the legal restrictions were quite narrow. In most states, a TIF can only be established in areas where a sufficient number of properties are considered "blighted" (Weber 2010). A second common criterion that municipalities must meet in order to establish a TIF district is to demonstrate that economic development within the proposed district would not occur in the absence of a TIF (2010). This criteria is commonly referred to as the "but-

for" criteria, and 20 states require a finding that a new development would not take place in the TIF district but for government intervention (Briffault 2010). In states like Texas, however, the rules defining under what circumstances a TIF may be established are much less limited and as such TIF adoption is more liberally applied as a potential solution for local decision makers.

TIF Adoption

A potential TIF district may be identified in one of two ways. TIF districts can either be created by a city council vote or through voter petition. A city council will determine the geographic boundaries and the expiration date for the district. Once the district has been created, the assessed property value on which each governmental unit participating in the TIF calculates its property tax levy is frozen for all properties within the boundary in the year the district is created. This is commonly referred to as the base assessed value or *tax increment base*. The expectation is that property values will increase as improvements are made to the district. The amount that exceeds the frozen assessed value is called the *incremental assessed value*.

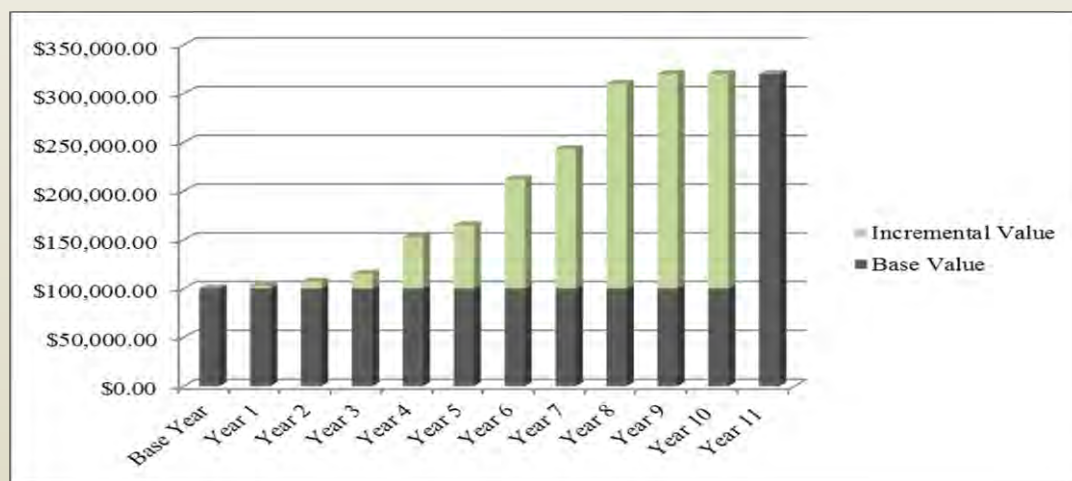
TIF Funding

Once a TIF district has been established, it is generally funded through one of two ways. TIFs can either be funded through the pay-as-you-go method or costs can be borne up front through the passage of a bond package (Klacik & Nunn 2001). The pay-as-you-go method is certainly the most financially prudent. Incremental revenue is generated on an annual basis through natural property value increases. These revenues are deposited into a TIF fund and spent as they are made available. This method has the advantage of being truly debt-free, but revenue generation can be quite limited as incremental revenue is created based on unaided property value growth within the district. Most importantly, pay-as-you-go will not work in cases where

property values are either stagnate or declining. For these reasons, debt-financed improvements are more popular.

In a bond-financed scenario, a bond package is usually passed to pay for infrastructure improvements within the TIF district. Debt-financing allows for upfront improvements before any incremental revenues have been realized. Improvements to the district are expected to raise the value of property within the district (Klacik & Nunn 2001).

Figure 1.1: Hypothetical Tax Increment Finance Revenue Structure



The Incremental Value is the property value increase above the base value that is set at the time the TIF is created. Revenue collected by applying the statutory tax rate to the incremental value is used to fund improvements within the district.

The Base Value is the value of all property at the time the TIF is established. The base value is frozen until the TIF expires. A jurisdiction may collect revenue by applying its statutory tax rate to the frozen base value only. When the TIF expires, jurisdictions may collect revenue on the incremental increase.

While each governmental unit participating in the TIF district collects property tax revenue on the tax increment base, property tax revenue earned on the incremental assessed value is used to retire the bond. *Figure 1.1* illustrates the process of tax increment financing. Once the TIF reaches its expiration date, the municipal government can either vote to renew the district or dissolve it. If the municipal government votes to dissolve the district, then the frozen value is eliminated and the entire value of the property within the district is returned to the tax roll.

As the hypothetical example in *Figure 1.1* demonstrates, the assessed value of all property within the district was nearly \$100,000 when the TIF was established which is represented as the *base year*. Infrastructure improvements within the district cause the property values to increase slightly at first, but substantial growth is seen in year four and beyond as improvement projects are completed. The increases in property values above the base assessed value are not funneled into a city's general revenue. Instead, revenue captured is used to finance the infrastructure projects within the district, creating a "closed-loop." In this scenario, TIF is considered a self-financing mechanism. This closed-loop is one of the strongest arguments that proponents cite when promoting TIF. During the entire life of the district, the municipal government and any overlapping jurisdictions affected will continue to collect taxes on the base assessed value.

The following pictures illustrate the economic development tax increment financing is intended to generate. The first picture represents tax increment financing in its traditional role as a urban redevelopment tool. The city of Dallas established the City Center TIF District in 1996. This TIF encompasses the traditional core of downtown. During the life of this TIF, The City of Dallas has invested over \$350 million in downtown projects and secured an additional \$1.4

billion in private investment.¹ TIF provided the mechanism to pay for the upfront improvements needed to attract new investments. One of the latest projects financed through the district is development of the Arts District.

The picture provided lists many of the new venues that were completed during a \$354 million arts district expansion project in October 2009.² These venues include various performance halls, parks, and art installations. Tax increment financing provided the capital backing that allowed for targeted infrastructure improvements to this district. While many of the projects that are completed within a TIF district are private projects, the TIF provides the economic incentive absent in blighted areas through improvements and targeted investment.

City of Dallas City Center TIF: Arts District Development Project



Source: Dallas Economic Development (See: <http://www.dallas-ecodev.org/incentives/tifs-pids/city-center-tif/>).

¹ Dallas Office of Economic Development, —Downtown Overview Brochure,” See: <http://www.dallas-ecodev.org/wp-content/uploads/2012/04/CBD-Brochure.pdf>. 05/01/2013.

² Dallas Office of Economic Development, —Downtown Overview Brochure,” See: <http://www.dallas-ecodev.org/wp-content/uploads/2012/04/CBD-Brochure.pdf>. 05/01/2013.

Another example is the Mueller Redevelopment Project in the City of Austin. The goal of this project was to redevelop the disused Robert Mueller Municipal Airport, which encompasses 7000 acres of land just north of downtown Austin along Interstate 35 and 51st Street. The project was carefully planned to be a pedestrian-scaled, mixed-used community.³ The Mueller TIF district is also part of a broader goal of revitalizing East Austin and promotion of environmentally sustainable development. The master plan includes more than 5,700 homes, 140 acres of public open space, 13 miles of hike and bike trails, retail shops and plazas, Dell Children's Medical Center, The University of Texas Medical Research Campus, and Austin Film Studios.⁴ The following before and after pictures provide a particularly illustrative example of the economic transformation that can occur when undeveloped, blighted, or underutilized areas are targeted for development through TIF districting.

Mueller Airport before Redevelopment



Source: Mays, Richard. "Austin Executive Airport expected to spur local economy." Examiner.com, 01/23/2010, <http://www.examiner.com/article/austin-executive-airport-expected-to-spur-local-economy>. 05/01/2013.

³ City of Austin Economic Growth and Redevelopment Services Office, Mueller Redevelopment. See: <http://austintexas.gov/departments/mueller-redevelopment>. 05/01/2013.

⁴ Catellus Mueller Website, About Mueller, See: <http://www.muelleraustin.com/about/about-mueller>. 05/01/2013.

Mueller Airport after Development



Source: Myers, Stephanie, "Does Decades-Old Mueller Plan Still Measure Up in Changing City?" Austin Post. 04/10/2013. See: <http://www.austinpost.org/boom-town/mueller>. 05/01/2013.

Impact on Overlapping Jurisdictions

The impact on overlapping jurisdictions is often the most common point of contention between municipal governments and affected overlapping jurisdictions. "The TIF mechanism involves implicit subsidies across local government units to the TIF-enacting government" (Johnson & Man 2001, 5). Through traditional means of financing, municipalities and by extension the citizens within that municipality must bear the costs of financing projects within their city through higher tax rates. Yet, as the argument goes in favor of TIF districts, overlapping jurisdictions like school districts reap the benefit of such projects through higher property values and, thus, increased revenue. Theoretically, all overlapping jurisdictions ultimately benefit from projects funded within a TIF district, though the benefits may not be realized for many years out (often as much as 40 years).

The impact on overlapping jurisdictions is examined more thoroughly in Chapters Two and Three, but it is important to demonstrate how TIF districts affect other taxing jurisdictions. Continuing with the example presented in *Figure 1.1*, the following table shows the yield to the

TIF district in the tenth year. There are four participating jurisdictions in *Table 1.1*. The actual number of overlapping jurisdictions can vary greatly. In states that require participation, any taxing entity with jurisdiction within the defined TIF boundaries must participate.

Table 1.1: Hypothetical TIF District Revenue Generation

Participating Jurisdictions	Baseline Assessed Value	Property Assessment (Year 10)	Tax Increment (Captured Value)	Participating Jurisdiction tax rate (Per \$100AV)	Yield to TIF District
City	\$100,000	\$320,000	\$220,000	\$0.50	\$1,100
County	\$100,000	\$320,000	\$220,000	\$0.35	\$770
School District	\$100,000	\$320,000	\$220,000	\$1.25	\$2,750
Hospital District	\$100,000	\$320,000	\$220,000	\$0.85	\$1,870

It is not uncommon to see districts with as many as ten participating jurisdictions. In the example presented here, the county government, the local school district, and a local hospital district all have taxing jurisdiction that lies within the TIF district. As such, each overlapping jurisdiction may only collect the base assessed value on all property within the district. After ten years, the property within this hypothetical TIF district has increased 220 percent from \$100,000 to \$320,000. For the entire life of the TIF district, each jurisdiction collected tax revenue on the base assessed value of \$100,000. While each jurisdiction's statutory tax rate is applied to the incremental value at year ten of \$220,000, that tax revenue is diverted to fund any expenditures incurred by the TIF district.

Though the numbers presented in this example represent a particularly small project, many TIF districts encompass properties that in total are worth many millions of dollars. In these

cases, the revenue generated from the district is quite substantial. In fact, TIF districts located in the downtown cores of cities like Houston or Dallas include properties totaling in the billions of dollars. Given the widespread use of TIF and the substantial revenue generation involved, several strong arguments have evolved over the years in favor and in opposition to tax increment financing.

Perceived Benefits of TIF

Several criticisms and benefits have developed over the years as the use of tax increment financing has increased in popularity. Though TIF is one of the most popular tools of economic development, it is by no means the only option available to local decision makers. There are several advantages that make TIF popular. First, TIFs like many other special purpose districts are geographically targeted. Theoretically, TIF allows local governments the ability to target a particular area for improvements thereby stimulating economic activity and thus resulting in lower unemployment, higher wages, increased property values, and more tax revenues (Johnson & Man 2001, 3). It is also possible that TIF districts have a spillover effect and create economic growth outside of the district, as well (Anderson 1990; Johnson & Man 2001).

As TIF is a targeted means of development, the costs of the project are borne by the individual property owners within the district who stand to benefit from increased economic activity. In this sense, TIF is theoretically a financing mechanism that most closely adheres to the benefit principle which states, “...each taxpayer contributes in line with the benefits which he receives from public services” (Musgrave and Musgrave 1989). As increased economic activity increases the value of property within the districts, those property owners pay more in property taxes, which then finance the improvements made to the district in the first place.

Another common argument cited by TIF proponents is that TIF is also a self-financing mechanism. Development projects under tax increment financing, whether funded on a pay-as-you-go basis or through TIF bonds are paid for through the increased tax revenues generated by the new investments (Greuling 1987). The improvements, in the long run, generate additional tax revenue for all affected local governments without placing a burden on individual taxpayers through the form of higher tax rates (Johnson & Man 2001, 3).

Finally, TIF provides local governments flexibility in correcting perceived market failures. First, the TIF process can be initiated at any time where a city meets the statutory standards and demonstrates financial feasibility (Paetsch & Dahlstrom 1990). TIF can be used in combination with other economic incentives to renew neglected areas where a private market incentive to develop no longer exist; however, unlike other development programs like tax abatements, TIF may create economic activity without providing expensive tax breaks. Also, TIF is politically attractive in the perception that it pays for itself (Johnson & Man 2001, 4). This makes TIF extremely attractive especially when local taxpayers are hostile to tax increases. While there are several perceived benefits there are also some common criticisms.

Criticisms of TIF

There are three fundamental criticisms of tax increment financing. First, many critics argue that TIF as an economic development program is ineffective. The creation of a TIF district incentivizes development within the district, and rather than generate new economic activity, TIF merely shifts economic activity away from non-TIF areas (Johnson & Man 2001). Even in cases where economic development does result, it is difficult to determine a causal link, and some critics argue that economic development would have occurred in the absence of a TIF district. This leads to the second major criticism.

If development would have occurred in the absence of a TIF, then TIF is simply a tool that enables local governments to capture revenue from overlapping jurisdictions as a means of subsidizing development projects (Anderson 1990). The perception held by affected governments of having lost revenue is rooted in the idea that higher tax rates will have to be imposed to meet the rising costs of increased local service demand. For example, school districts are often the most critical of tax increment financing. Increased economic development is often coupled by in-migration from other communities, increasing student enrollments. Such demand cannot be offset by increased tax revenues captured by the TIF district.

Finally, critics argue that TIF and other local development programs promote a zero-sum game. States and cities compete with each other to attract new business. A city may forego many millions of dollars in future tax revenue to sway a firm's location decision though the firm has already decided where to locate and such incentives have only a marginal impact on such decisions (Johnson & Man 2001, 5). In such a scenario, cities merely compete in a race to the bottom. TIF districts may provide little economic gain for benefits that may not be realized twenty, thirty, or forty years into the future.

Research Purpose

The criticisms briefly discussed in this chapter are investigated in greater detail in the review of the literature in Chapter Three. What will be clear is that there are three primary goals of past research: (1) as a practical matter, to explain how TIF works; (2) to determine the factors that influence TIF adoption; and (3) to determine whether TIF provides an economic benefit. This research branches off from the second goal and seeks to explain whether four particular factors of TIF adoption also influence the size of TIF districts adopted. The four factors studied in this research as identified in the literature are: the expectation of economic generation;

competition between municipalities; revenue capture as a means of subsidizing capital improvements; and path dependency. The question of this research is whether or not the same factors that influence TIF adoption influence the size of the TIFs adopted. This research focuses on the size of TIFs in acres as an attempt at measuring the magnitude of TIF-use in Texas. Whether the factors that influence TIF adoption influence the size of TIF districts adopted is a novel question, and it is based on the assumptions discussed in the literature review.

Texas is the setting of this research for several reasons that are discussed in Chapter Two, but are worth briefly mentioning. A significant body of research on TIF exists given its widespread popularity, yet there is no study of the application of tax increment financing and the theoretical benefits of tax increment financing in Texas. This research seeks to address this dearth in the literature, as the scholarly literature is primarily confined to Midwestern states in the Great Lakes region (i.e. Minnesota, Wisconsin, Illinois, Indiana, Ohio, and Michigan). Research on tax incrementing financing in Texas is academically valuable for several reasons. First, Texas is the second most populous state and had a 2010 gross state product of \$1.2 trillion.⁵ This is larger than the GDPs of Australia, Mexico, and South Korea.⁶ Tax increment financing districts encompass many billions of dollars in real property across the state. Given this magnitude, it is important for policy makers to understand not only how TIF works mechanically, but also the potential impacts TIF adoption may have on both the city government and affected taxing jurisdictions.

Second, the demographic and economic patterns in Texas over the last thirty years are substantially different than those in the states where TIF research has been most focused. While,

⁵ Texas Comptroller of Public Accounts. *The Texas Economy*. See: <http://www.thetexaseconomy.org/economic-outlook/economy/articles/article.php?name=DD-GDPbyState>. 04/01/2013.

⁶ The World Bank. Data: GDP (current US\$). See: <http://data.worldbank.org/indicator/NY.GDP.MKTP.CD>. 04.01/2013.

TIF is most predominately used in more traditional urban centers like Houston, San Antonio, and Dallas, TIF has also been widely utilized by suburban cities and towns, which in many cases have consistently experienced significant growths in population for the last decade. Twelve Texas counties are among the 50 fastest growing counties in the U.S.⁷ Nine of these 12 currently have active TIF districts, and TIF adoption has been quite extensive in four of these counties (Collin, Denton, Fort Bend, Montgomery, and Travis County).⁸ Where TIF has been widely studied in cities experiencing population declines or weak economic conditions, TIF use in Texas has only grown more popular despite strong economic growth. Though some research has cited the use of TIF as a growth management tool⁹, the economic conditions of Texas are markedly different and more research is warranted, especially in a state as large and as economically powerful as Texas.

Conclusion

This chapter provides a foundational understanding of how tax increment financing works theoretically, and it also explores the perceived benefits and common criticisms of TIF. Chapter Two expands on the unique circumstances of TIF adoption in Texas, and Chapter Three discusses the relevant literature on tax increment financing focusing primarily on the criticisms articulated in this chapter and presents the conceptual framework. Chapter Four explains the methodology of this study and presents the operationalization table. Chapter Five presents the findings, and this research is concluded in Chapter Six.

⁷ U.S. Census Bureau. *Resident Population Estimates for the 100 Fastest Growing U.S. Counties with 10,000 or More Population in 2012*. <http://www.census.gov/popest/data/counties/totals/2012/>. 04/01/2013.

⁸ U.S. Census Bureau. *Resident Population Estimates for the 100 Fastest Growing U.S. Counties with 10,000 or More Population in 2012*. <http://www.census.gov/popest/data/counties/totals/2012/>. 04/01/2013.

⁹ See: Briffault (2010); Dye a& Merriman (2006); Man & Rosentraub (1998)

Chapter Two: Setting

Purpose

Chapter One discussed broadly the mechanics of tax increment financing and the prevailing benefits and criticisms of TIF. This chapter consists of a more focused discussion of TIF as it is applied in Texas before moving on to a discussion of the scholarly literature in Chapter Three within the context of the research purpose. Tax increment financing as it is applied in Texas is unique from many other states for two primary reasons: (1) Texas' TIF-enabling legislation is much more flexible and allows for broader interpretation of the "blight" requirement common in other states and; (2) Texas allows overlapping jurisdictions to either opt out of participating in a TIF completely or define a percentage of contribution. These two factors are discussed in more depth in the following sections, but first a brief discussion of the history of tax increment financing is warranted.

1950s-1970s: First Adoption of TIF

TIFs were first employed in California in 1952 (Klacik & Nunn 2001, 17). TIF districts were created as a means of financing redevelopment projects, especially in urban areas. When TIF was first used it was designed as a means of providing local matching funds for federal grants (Huddleston 1979). Though TIF was rapidly adopted in California, TIF-enabling legislation was slow to pass in other states. By 1970, only seven states including California had passed legislation authorizing local governments to establish TIF districts (Johnson 2001, 31). For much of the 1950s through the 1970s, the federal government provided billions of dollars in grants for urban development. TIFs were created out of a need to finance costly redevelopment projects in blighted urban areas where no economic incentive to develop existed. However, by

the 1980s, several factors would coalesce to make tax increment financing more attractive to state and local policymakers.

1980s-2000s: Increase in TIF Popularity

Several forces developed in the 1980s that encouraged more widespread adoption of tax increment financing. Most importantly a decline in federal aid for urban redevelopment, social and economic decline in urban centers, and general voter hostility toward property tax increases pressured local governments to find alternative means of funding development and improvements (Klemanski 1990). From 1985 to 2000, federal outlays in the form of Urban Development Action grants declined from \$497 million to \$10 million, which represents a decline of 98%.¹⁰ During the same time period, TIF-enabling legislation was passed in 28 states by 1984, 33 states by 1987, and 44 states by 1992 (Klacik & Nunn 2001, 18). By 1997, forty-eight states had passed legislation authorizing TIF (Johnson & Kriz 2001). Today, all states except for Arizona have passed legislation authorizing the use of TIF.

The decline in state aid coupled with a need to revitalize urban city centers forced local governments to find alternative methods to fund costly capital projects. TIF became popular because it provided an easy political means to accomplish these goals. While TIF could be voter driven through a petition signed by landowners, it is more often established by city councils. In many states, the creation of TIF does not require a citywide vote or active participation of affected local jurisdictions (Johnson & Man, 2001).

¹⁰ Figures calculated using OMB Historical Table 12.3—Total Outlays for Grants to State and Local Governments by Function, Agency, and Program: 1940–2013. <http://www.whitehouse.gov/omb/budget/Historicals/>.

2000 and Beyond: Renewed Criticism

While TIF districts remain popular they have faced much criticism in recent years. The strongest criticisms are that TIF districts do not provide the promised economic activity and are simply a means of capturing revenue from overlapping jurisdictions. These questions are discussed in more detail in Chapter Three. Though it is worth mentioning that California Governor Jerry Brown submitted a proposal in 2011 to end tax increment financing initiatives in the state, and as of January 2012 the California Supreme Court issued a ruling effectively shutting down the state's TIF districts of which there are over 400.¹¹ The move comes in an effort to close California's \$26 billion budget deficit. Currently, California's redevelopment districts capture 12% of the state's property tax or \$5 billion annually.¹² It will be interesting to see if developments in California signal a renewed hostility toward TIF in other states facing budgetary shortfalls.

Overview of Tax Increment Financing in Texas

Legislation enabling the creation of tax increment financing districts was first passed in Texas in 1981 after three separate attempts to pass TIF-enabling legislation through the legislature (Arvidson et al 2001, 155). A first attempt at passing TIF-enabling legislation was made in 1977 with a constitutional amendment permitting TIF as a legitimate tool of redevelopment (157). However, this first bill, though popular among local governments, failed to garner enough votes from a skeptical electorate. The bill that finally passed the legislature was passed during a special session in 1981. The local growth coalition was strong, and opposition on

¹¹ Segal, Brad. "As California's TIF Goes, so Might Colorado's." *Denver Business Journal*. Jan. 13, 2012. <http://www.bizjournals.com/denver/print-edition/2012/01/13/as-californias-tif-goes-so-might.html?page=all>

¹² Ibid.

the bill was largely muted (158). Due to the circumstances under which the bill was passed, the Texas TIF legislation is much more flexible than in many other states.

Broad Interpretation of TIF Adoption Criteria

In Texas, a tax increment financing district may be adopted through petition or city council vote alone if it meets one of the following criteria as defined in Chapter 311 of the Texas Tax Code:

1. The area's present condition must substantially impair the city's growth, retard the provision of housing, or constitute an economic or social liability to the public health, safety, morals or welfare. Further, this condition must exist because of the presence of one or more of the following conditions: a substantial number of substandard or deteriorating structures, inadequate sidewalks or street layout, faulty lot layouts, unsanitary or unsafe conditions, a tax or special assessment delinquency that exceeds the fair market value of the land; defective or unusual conditions of title, or conditions that endanger life or property by fire or other cause; or
2. The area is predominately open, and because of obsolete platting, deteriorating structures or other factors, it substantially impairs the growth of the city; or
3. The area is in or adjacent to a "federally assisted new community" as defined under Tax Code Section 311.005(b).

Though these standards do contain the "blight" requirement common in most TIF-enabling legislation, what is unique is criteria number 2, which allows for the creation of a TIF for open, undeveloped land. This requirement illuminates one of the fundamental

differences between Texas and the states that have most utilized TIF and have been the primary focus of research to date.

Most research on TIF has focused on states in the Great Lakes Region. Unlike these states, Texas has experienced significant growth since the 1980s. The contrast in population growth is presented in *Figures 2.1 and 2.2*. In these figures, the population growth of Dallas, Houston, and San Antonio is compared to growth in three major Midwestern cities—Detroit, Minneapolis, and Milwaukee. Furthermore, while TIF has most extensively been used by San Antonio, Dallas, and Houston, the majority of active TIFs today are dispersed among many suburban communities that are part of the major metropolitan statistical areas of Texas and have historically experienced record growth. Such an environment would make TIF very attractive to local governments as a means of subsidizing upfront costs for needed infrastructure due to population growth.

TIF as a growth tool is more convincing when considering that undeveloped, open land may qualify for TIF designation by the Texas Tax Code. It is possible that cities in Texas, may adopt TIF as mechanism to channel and manage growth rather than the traditional use of TIF as a means of combating urban blight and sparking economic activity. A common practice in Texas is the designation of undeveloped land as a TIF district in conjunction with the development of a residential subdivision. These projects are often developer initiated projects where the developer of such a project will provide the necessary infrastructure upfront in return for compensation through tax increment financing.

Figure 2.1: Population Growth in Detroit, Minneapolis, and Milwaukee, 1950-2010

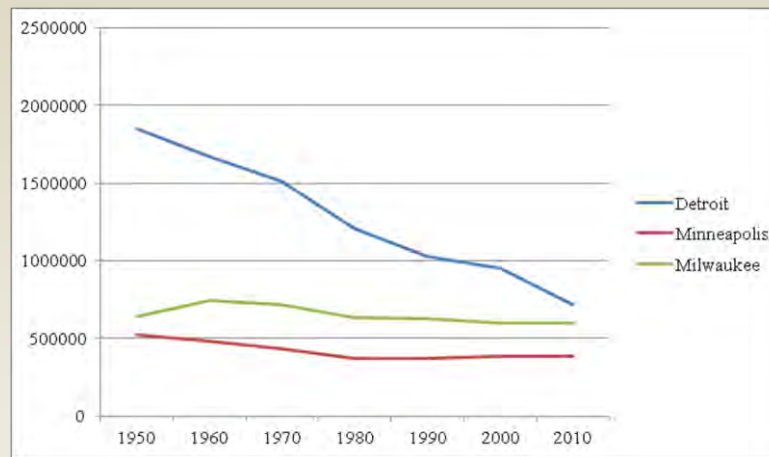
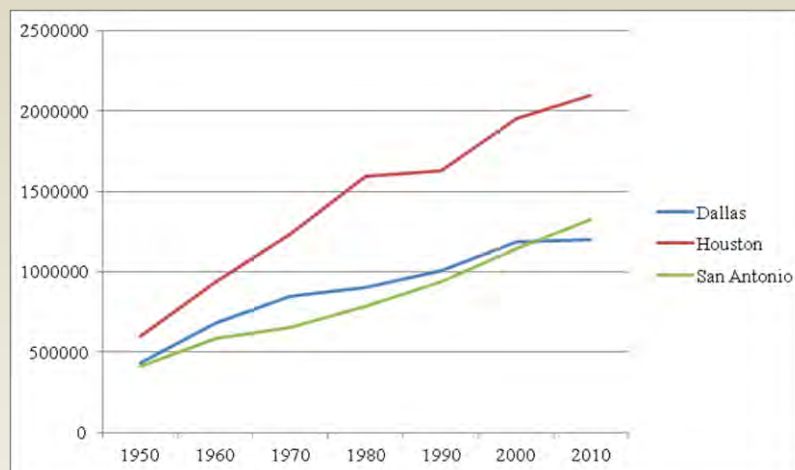


Figure 2.2: Population Growth in Dallas, Houston, and San Antonio, 1950-2010



Voluntary Participation of Overlapping Jurisdictions

Voluntary participation is the second major difference in how tax increment financing is applied in Texas. Unlike many states, Texas provides overlapping jurisdictions several options. Affected taxing units like school districts may set a specified percentage of their contribution to the TIF fund, offer tax abatements on real property to property owners directly in lieu of participation, or elect to not participate at all.¹³

As of 1999, overlapping jurisdictions may choose to not participate in the TIF district and elect to capture all incremental tax revenue for itself without giving the TIF governing body notice. In the 1990s, the state agreed not to reduce state aid under the school equalization program when property values increased in TIF districts. This provided protection for school districts who could not utilize incremental revenues until the TIF district expired. However, this incentive was removed in 1999, and as a consequence school districts generally do not participate in TIF districts. In fact, for TIFs created after 2000, the county government is often the only participating overlapping jurisdiction.

The following real-world examples illustrate the nature of infrastructure improvement projects carried out in TIF districts and demonstrate two unique factors of TIFs in Texas. First, while some states require full participation of all tax units, Texas allows affected taxing units the option of not participating at all or negotiating the level of participation.

Cityplace Redevelopment Project- Dallas, TX

Like many urban centers, the City of Dallas has a number of projects aimed at redeveloping and revitalizing its downtown core. Cityplace is one such project. The city established the Cityplace TIF District in 1992 for a life of 20 years in order to —achieve the

¹³ State Comptroller Tax Increment Finance Registry. See: <http://www.window.state.tx.us/taxinfo/proptax/registry06/finance.html>. (03/01/2013).

objective of accelerated retail, housing, and office development by providing for a long term program to replace and upgrade area infrastructure.”¹⁴ Some of the infrastructure improvements for the project included: street, utility, and intersection improvements; updated water distribution and wastewater systems; extensions of the McKinney Avenue trolley service; and extensions to the hike and bike trail. According to the Office of Economic Development, the district encompasses about 160 acres and over 1,000 individual properties.¹⁵ When it was created, the total assessed value of all property within the district was appraised at \$45,065,342.¹⁶ This amount is the frozen assessed value on which all participating tax units may collect property tax revenue. To note, there are five separate taxing units participating in the Cityplace TIF. Those units include the City of Dallas, Dallas County, the Dallas County Hospital District, the Dallas County Community College District, and the Dallas County Independent School District. Each taxing unit is participating at 100%. What this means is that each individual participant’s property tax rate is applied to the incremental value and 100% of the revenue generated is used to fund the TIF district.

By 2007, the total appraised value of the district was \$470,137,188. By subtracting the frozen assessed value of \$45,065,342 it shows that the remaining \$425,071,846 represents the incremental value.¹⁷ Tax revenue collected on the incremental value is what finances the bonds that were passed to pay for the public improvements to the district. Once the Cityplace TIF District expired at the end of 2012, the incremental value or captured value was returned to the tax rolls and the diverted revenues used to fund the district are now collected by each affected tax unit.

¹⁴ City of Dallas Office of Economic Development. Cityplace Area TIF District. See: http://www.dallas-ecodev.org/wp-content/uploads/2012/04/CityPlace_marketing.pdf . (03/01/2013).

¹⁵ City of Dallas Office of Economic Development. Cityplace Area TIF District. See: <http://www.dallas-ecodev.org/wp-content>. (03/01/2013).

¹⁶ Ibid.

¹⁷ Ibid.

Fifth Ward- Houston, TX

The City of Houston established a TIF in 1999 for 30 years on 241 acres located in the Fifth Ward. In order to encourage development, the city created the TIF to fund various infrastructure improvements. While the city of Houston is participating at 100%, the Houston Independent School District is only participating at 63%.¹⁸ This means that only 63% of revenue collected by applying the HISD property tax rate to the incremental value is collected by the TIF district. The remaining 37% is collected by HISD. This arrangement allows HISD to offset the cost that a potential increase in service would necessitate. The frozen assessed value of property within the district is \$21,543,150. The total appraised value in 2007 was \$26,705,839 of which \$5,162,689 represents the incremental value on which revenue is collected to finance improvements in the district.¹⁹ Unlike Cityplace, improvements in the Fifth Ward are not debt financed. As revenue is collected directly from the incremental value, improvements are paid for. This makes the Fifth Ward project truly self-financed. It also demonstrates one of the dynamics in tax increment financing. Districts that issue bonds to finance improvements upfront often experience higher growth rates than TIFs that employ a pay-as-you-go strategy.

TIF Adoption in Texas

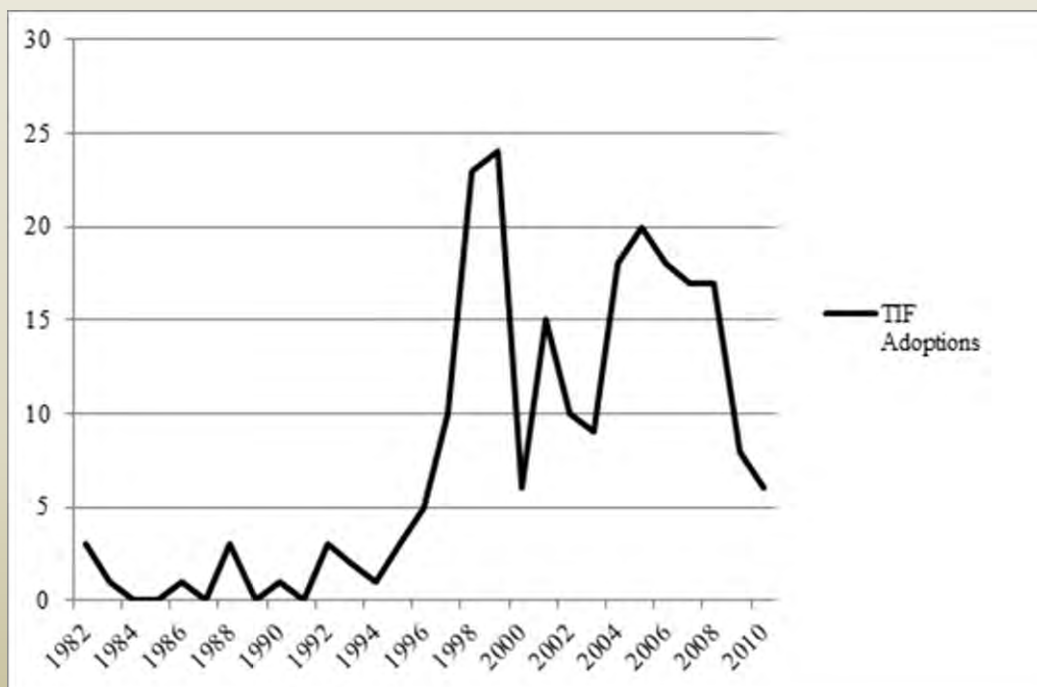
Upon passage of TIF-enabling legislation in 1981, few Texas cities were quick to establish TIF districts. Original authorizing legislation only allowed for the creation of TIF through city council vote. Though today, the largest cities of Dallas, Houston, and San Antonio have the most active TIFs, none of these large cities used TIFs until legislation was amended to allow TIF adoption via property owner petition in 1989 (Arvidson et al 2001, 163). *Figure 2.3*

¹⁸ Texas Comptroller 2012 Biennial Registries of Reinvestment Zones for Tax Abatements and Tax Increment Financing. See: http://www.texasahead.org/reports/TIF_Abatement/2012/registry.pdf

¹⁹ Ibid.

shows the frequency of TIF adoption by year. Prior to 1985, fewer than five TIFs were established each year. TIF adoption increased significantly after 1995; there were 23 TIFs created in 1998 and 24 in 1999. Following the year 2000, TIF adoption hit another peak in 2005 with 20 adoptions.

Figure 2.3: Frequency of TIF Adoption in Texas, 1982-2010



Currently, there are approximately 223 active TIFs in Texas today, and there have been many more adopted and expired over the course of the last thirty years. Unfortunately, information on expired TIFs prior to 2002 is unavailable as the state did not mandate a central registry until 2000. Thankfully, data on many of the earliest TIF districts is available due to the substantially long durations of the districts. The duration of a TIF district ranges from a

minimum of 10 years to a maximum of 41, and the average life of a TIF district in Texas is about 26 years. Cities can choose to terminate TIF districts before their statutory expiration date, but this is rare. Also in rare cases, the life of some TIF districts have been extended beyond the original duration set by the local government when the district was created. The size of TIF districts is also quite variable.

TIF districts in Texas range in size from a minimum of 4.43 acres to a maximum of 12,800 acres. Currently, the smallest TIF district is located in Burleson, which is a small city about 25 miles southwest of Arlington. Districts like the one in Burleson may finance a very narrow project encompassing a few city blocks. In contrast, the city of Temple, located about 70 miles north of Austin, adopted one of the first TIFs in 1982. TIRZ #1 as it is formally labeled by the state is 12,800 acres. This is the largest currently active TIF and encompasses a wide swath of commercial land. The district was created to finance downtown redevelopment. Though these two represent minimum and maximum, the average TIF district is about 825 acres in size and the average tax increment base is about \$85,820,358.

Conclusion

While Chapter One provided a broad theoretical overview of tax increment financing, Chapter Two defined the setting of this research and the mechanics of TIF specific to Texas. As demonstrated in this chapter, TIF administration in Texas is distinctly different than in states that have been the primary focus of scholarly research. Chapter Three will focus on the specific factors identified in the literature from which the hypotheses to be tested were drawn. The literature review will focus on economic performance, competitive adoption, the potential for revenue capture, fiscal stress, and the effect of path dependency on the likelihood of TIF adoption.

Chapter Three: Literature Review

Chapter Purpose

The purpose of this chapter is to examine the scholarly literature on tax increment financing. The chapter begins with a discussion of the theory of fiscal federalism. This discussion is followed by a review of the primary questions that have driven the scholarly research on tax increment financing. These questions are “Do TIFs provide an economic benefit?” and “What are the factors that influence TIF adoption?” These questions are explored through the main criticisms of tax increment financing discussed in Chapter One.²⁰ To review, the main criticisms of TIF are: (1) TIF is ineffective as an economic development tool; (2) TIF is a revenue-capturing tool whereby development is subsidized by overlapping jurisdictions; and (3) TIF is symptomatic of interjurisdictional competition. Specifically, this chapter provides a broad overview of fiscal federalism theory and discusses five specific factors of TIF adoption: economic effectiveness, competitive adoption, revenue capture, fiscal stress, and path dependency. These factors provide the scholarly justification for the four hypotheses presented in this chapter.

The Nature of Public Goods

A brief discussion of public goods is warranted before proceeding. Private market failure occurs largely due to the nature of public goods. Generally, public goods are non-exhaustive and non-exclusive. Non-exhaustion means that the benefits of a good or service can only be shared. In other words, “a given quantity of the service can be enjoyed by additional people with no reduction in benefit to the existing population” (Mikesell 2011, 5). National defense is a classic example. A government provisions and produces national defense for the country as a whole.

²⁰ See the following ARPs: (Lester 2005); (Quintero 2007); (De La Cerda 2010) for further reading on economic development in Texas

However, enjoying the benefit of national defense does not limit other individuals from fully enjoying the benefit, as well. In contrast, when one purchases a new car, the inventory is reduced and only the individual who purchased the car enjoys the benefit of owning that vehicle. Private goods are very clearly exhaustive. Consumers confront this reality and understand the disappointment felt when a new product is sold out. National defense also quite nicely illustrates the second property of non-exclusion.

A good is non-exclusive when the ~~benefits~~ benefits cannot be easily limited to those who have paid for the services” (Mikesell 2001, 5). Going back to the national defense example, despite any one particular individual’s level of contribution to funding national defense, each is afforded the same level of security. It is impossible to exclude free riders from enjoying the benefits a robust national defense provides. In another scenario, the homeowner association for a riverfront neighborhood would like to build a levee to protect the neighborhood from potential flooding. However, the neighborhood lacks a broad consensus on the value of constructing a levee. It might be the case that homeowners who live closest to the river desire more the construction of a levee than the homeowners farthest away from the river. The homeowners association may try and succeed in convincing all homeowners to participate in funding the levee construction. More likely, some homeowners will refuse, but the people who live closest to the river will make up the difference and have the levee constructed. Once the levee is constructed, everyone in the neighborhood benefits from the flood protection it provides regardless of whether or not every individual paid for the levee. Both of these characteristics make efficient production and provision of such goods impossible in the private market. As a result, it is the chief function of government to identify and apply policy remedies for various market failures. "The public economist's job is largely to diagnose the source of the ills, prescribe the appropriate remedy, and

then leave public officials to fill the prescription" (Oates 2005, 350). Fiscal federalism addresses the question of which level of government is best suited to provide particular goods.

Fiscal Federalism Theory²¹

Wallace Oates (1994) broadly applies the term fiscal federalism "to any public sector with two or more levels of decision making" (127). In this regard, virtually any public sector structure is federal in nature as fiscal decisions are made at different levels. More specifically, the theory of fiscal federalism seeks to explain how multi-level government works and how it is structured. Traditional fiscal federalism theory makes several assumptions. First, the public sector is assumed to have a key role to play in correcting market failure (Oates 2005).

Which level of government should provision which good is a key question addressed by traditional fiscal federalism theory. According to Quigley & Rubinfeld (1997), two issues related to efficiency arise in a federalist economy. The first issue deals with the appropriate allocation of people and capital among jurisdictions (Quigley & Rubinfeld 1997, 9). Inefficiencies arise because benefits provided in one jurisdiction can have a spillover effect and benefit individuals in another jurisdiction. The result is citizens in one jurisdiction subsidizing a benefit enjoyed by individuals in another jurisdiction. For example, the City of New Braunfels pays to maintain the city parks and riverfront of the Guadalupe River, which is a very popular destination for city residents whose tax dollars pay to maintain the park and river. However, the river is also a very popular destination for residents outside of New Braunfels. When these people visit free parks, they enjoy the benefit of the river and parklands but do not pay to use or maintain it. The second issue concerns intrajurisdictional efficiency.

²¹ Fiscal Federalism lies within the broader theory on public finance. See (Bartle & Shields 2008); (Buchanan & Musgrave 1999); (Hansjurgens 2000); (Musgrave 1969); (Musgrave & Musgrave 1989); (Rosen 1985); for further reading on public finance theory and public budgeting.

—Intrajurisdictional efficiency is achieved when the choice of government activities in each jurisdiction maximizes the sum of all residents' willingness to pay for those activities net of any cost" (Quigley & Rubinfeld 1997, 10). Ideally a government will provide the maximum amount of a good at a level and price that the residents within the community find acceptable. Both interjurisdictional efficiency and intrajurisdictional efficiency are related and involve a tradeoff. Typically, the larger the jurisdiction the less likely spillover will occur and benefits and costs will be internalized. Yet, in larger jurisdictions, it is less likely that the political process will produce the maximum output of a good or service (1997, 10). Why is this? Populations within larger jurisdictions tend to be less homogenous and thus different groups tend to have differing views of what goods or services should be provided and at what level. A federalist structure addresses these two issues.

According to traditional fiscal federalism theory, central governments should provide goods that create significant spill-over effects, because spill-over effects are difficult for local governments to internalize (Bordignon & Ambrosanio 2006). Activities like national defense or macro-economic stabilization policies should be carried by a central government. On the other hand, local governments are best suited to provide service like education or police and fire protection, because local governments are more attuned to the needs of their citizens. Such goods provided by a central government in a one-size-fits-all manner would result in inefficient provision of such goods because preferences and needs may vary greatly from community to community. Similarly, economic development policies like tax increment financing are handled at the local level because the local political process can more closely capture the needs of citizens.

Traditional fiscal federalism assumes that political leaders are benevolent actors who seek to maximize the social welfare of their constituents (Rodden 2006). It follows that the demand for public goods vary geographically and that local governments are better suited to meet the demands of their citizenry than a centralized government. This observation was formalized as the Decentralization Theorem (Oates 2005). Local public goods have the potential to be provided by local governments at their optimal level. Outcomes tailored to the demands of each jurisdiction will clearly provide a higher level of social welfare than one in which a central government provides a single, uniform, level of public output in all jurisdictions” (Oates 2005, 351). A second theoretical perspective of public decision-making argued by public choice theorists contrasts the image of the benevolent actor assumed in traditional fiscal federalism theory.

Public Choice Theory

—A central tenet of the public-choice approach is the view that public decision-makers are utility maximizers with their own objective functions” (Oates 2005, 355). Public Choice theorists depart from traditional fiscal federalism in the nature of political actors. While traditional fiscal federalism holds that political actors are benevolent and motivated to maximize social welfare, public choice theorists contend that public agents are motivated to maximize the size of their budgets (Oates 2005). Given this motivation, public choice theorists believe it is the natural tendency of government to grow.

Public choice theorists visualize a central government as a great —Leviathan;” its motivation is maximizing revenues (Oates 2005). Decentralization of government (a federalist structure in the case of the United States) divides and limits the sovereignty of government. Political competition is a byproduct of decentralization. —Instead of a single Leviathan with

monopoly power over the tax base, decentralization creates competition among self-serving politicians” (Rodden 2006, 19). Political actors motivated by electoral pressure seek to maximize the social welfare of their constituents. To the public choice theorist, decentralization tames the Leviathan desire to extract more and grow larger. Regardless, competition is the resulting outcome. Decentralization is not the only condition that creates competition; the nature of citizens also adds to the dynamic of competitiveness.

Competitive Federalism

In a competitive federalism model —governments must compete for citizens and firms, who sort themselves into the jurisdictions that best meet their preferences for bundles of government goods and policies” (Rodden 2006, 18). Economic development incentives are a tool that local governments use to encourage new businesses to relocate or encourage current businesses to remain. Most importantly, decentralization works to align local officials with the needs of their constituents (Rodden 2006). In a decentralized structure, local government leaders are responsible for providing local public goods. As a result, local leaders are more attuned to constituents’ demands. The force of competition increases accountability.

Citizens play a role in shaping what goods are desired and to what extent those goods are provided in a given city. Tiebout (1956) argued that a person’s decision to reside in one community or another is partly influenced by the availability and quality of services provided. Parks, fire and police protection, and the quality of schools are all important to potential residents. One of the implicit assumptions is that citizens vote with their feet and will move to the community that provides the desired level of services (Rodden 2006).

Accountable government is another benefit. If public choice theory proposes that citizens vote with their feet, then it follows that local governments are forced to compete —over mobile

sources of revenue, which prevent them from lining their pockets with public money” (Rodden 2006, 19). A citizen may be deterred from moving to a city if the local government is thought to be corrupt or incompetent. Likewise, a strong desire to move out of a corrupt city may develop. Presumably local citizens elect local leaders that enact policies consistent with their preferences. If not, the leaders are replaced. By voting with their feet, citizens move to communities that reflect their tax and service preferences. Citizens then elect or re-elect leaders consistent with their values and pocketbooks. This creates an economic problem. The wants of citizens are unlimited but revenues are limited. Therefore scarcity exists. Local governments, even if constrained by competition, confront citizen wants that exceed revenues. Local governments confronting fiscal stress need to find creative ways to finance infrastructure that do not raise taxes.

What is most striking from the theoretical discussion is while traditional fiscal federalists and public choice theorists disagree as to the motivations of political actors; both agree the competition that results from a federalist structure is a positive force that leads to efficient provision of goods and services. Efficient allocation of goods and services is a chief concern of local governments.²² Local governments compete with each other to provide the optimal level of taxes and services desired by mobile citizens who demonstrate their preferences by voting at the ballot box or voting with their feet. However, one of the primary criticisms of TIF cited in Chapter One is that TIF is the result of interjurisdictional competition. Critics argue that municipalities that provide development incentives are simply engaging in a race to the bottom in which everyone is worse off as a result. It seems that TIFs are symptomatic of a system that was intentionally designed to create competition! Moving beyond theory, this chapter next

²² See (Shields 1989) for an interesting discussion on optimal price setting.

explores the questions of economic development, competitive adoption, revenue capture, fiscal stress, and path dependency.

TIF as a Mechanism of Economic Development

Fostering economic development is important for state and local governments.

“Economic development policies typically employ the same strategy: to lower the cost of doing business and attracting economic development by way of tax incentives, improved infrastructure, or improved services to encourage economic investment” (Johnson & Man 2001, 1). Tax increment financing is a scheme to finance infrastructure improvements that in turn encourage investment in areas where private market demand for investment does not exist.

The scholarly literature on TIF²³ to date has focused on two primary questions: “Do TIFs provide an economic benefit?” and “What factors influence TIF adoption?” Practically speaking, the question of whether or not TIFs are economically beneficial is a primary concern among practitioners. Significant bonds are passed to finance infrastructure improvements and millions of dollars in real estate value is captured by TIF districts. Local decision makers want to know whether TIF is economically beneficial given the significant resources that are devoted to generating development within TIF districts. But how do scholars determine whether or not TIF districts provide an economic benefit? The focus of this question has evolved over the years. The earliest attempts at addressing the economic impact of TIF districts focused primarily on property value growth within the districts.

Davis (1989); Anderson (1990); Man & Rosentraub (1998); and Donaghy, Elson, & Knaap (1999) found a positive relationship between municipal property value growth and TIF

²³ See Anderson (1990); Bhatta et al (2003); Bhatta et al (2007); Byrne (2006); Byrne (2010); Carroll & Eger (2006); Davis (1989); Donaghy et al (1999); Dye & Merriman (2000); Dye & Merriman (2006); Huddleston (1982); Huddleston (2001); Jung et al (2009); Man & Rosentraub (1998); Merriman et. al (2011)

adoption. In addition, more recent empirical evidence bolsters these findings. Byrne (2006, 325) found that TIF districts grew at an average rate of 29.1% greater than the municipality as a whole. Smith (2009) studied TIFs in Chicago and found that "properties inside TIFs experienced a higher rate of appreciation in prices over the observation period when compared to those properties outside TIFs" (228). Carroll and Eger (2006, 469) found that TIF not only increases in-district property values, but has a positive spillover effect on property values outside TIF district, as well. Bhatta et al. (2007) found similar but more nuanced results concerning the spillover effect. Residential houses in close proximity to commercial and industrial TIFs appreciated at a slower rate than houses further away, but houses located near mixed-used TIF districts appreciated more quickly (2007). However, though TIF may stimulate property value growth within the district, there may not be a net positive impact on growth for the municipality as a whole.

Research by Dye and Merriman (2006) using data on TIFs in Illinois revealed two contradictory findings. The authors found no significant difference in growth rates between TIF-adopting municipalities and non-TIF-adopting municipalities and that non-TIF areas in municipalities may grow more slowly than similar areas in cities that do not use TIF (Dye & Merriman 2006). A study of Wisconsin municipalities came to similar conclusions. "Overall use of TIF in Wisconsin has stimulated real estate development within TIF district areas, but there is little evidence that TIF led to significant increases in aggregate property values in communities that use them" (Merriman et al 2011, 241). These results suggest that TIF districts do not stimulate new investment but merely reallocate development away from non-TIF areas. While Byrne (2006) did find positive growth in property values within TIF districts, there was large variation in growth, and Byrne points out that there is evidence to support the argument that

some natural growth is wrongly attributed to TIFs. The impact of a reallocation effect varies depending on the type of real estate.

A TIF district may encompass properties zoned for specific purposes or a variety of purposes. Most commonly, TIF districts are industrial, commercial, residential, or mixed-use in nature. TIF districts had the highest benefit (a regression coefficient of 1.92) on commercial property (Merriman et al 2011, 241). A coefficient of 1.92 means that each dollar of commercial development in a TIF district creates \$1.92 dollars of commercial development in the community as a whole. In contrast, coefficients for industrial and residential property were less than one. This suggests that reallocation may be most pronounced in residential and industrial development, but TIF stimulates commercial activity.

Moreover, the magnitude of growth in property values within TIFs depends largely on the type of property. “Placement within a TIF district established for the express purpose of either residential or mixed-use development does lead to an increase in the valuation of residential properties over time” (Carroll & Sachse 2004, 410). Bhatta et al (2007) found evidence that in the case of industrial property in Chicago, tax increment financing had no effect on property values.

What emerges from the literature that addresses the question of economic impact suggests that TIF is a legitimate tool that can effectively foster economic development. It is reasonable to expect that if a government directs resources to improve an underutilized area that significant growth rates will occur. This often times is indeed the case, and by this evidence alone it is not surprising that many local leaders have a favorable opinion of TIF. However, “observing high growth in an area targeted for development is unremarkable” (Dye & Merriman 2006, 7).

Hypothesis 1: Economic Stress

There is mixed evidence that demonstrates that TIF has a positive impact on aggregate municipal growth rates, though property values within TIF districts do grow substantially. Regardless of whether or not there is any negligible impact on local economies, there exists an expectation among municipal governments that tax increment financing is successful in fostering economic development. The desire to stimulate economic activity is a prime motivator in establishing a TIF district. Municipalities that have higher unemployment rates may find redevelopment tools like tax increment financing more attractive. This research proposes the assumption that the expectation of economic stimulus will also drive cities to adopt TIFs larger in size. Hence, one might expect:

H1: Municipalities located in counties with higher rates of unemployment will adopt TIFs that are larger in size.

TIF as a Mechanism of Competitive Adoption

Economic development tools like TIF arise out of competition for investment between governments. According to Johnson & Man (2001), local governments may be pressured to offer incentive packages to potential businesses to remain competitive with neighboring cities. Briffault (2010) shares in the view that TIF reflects and reinforces competition among neighboring governments as they bid for private investment. —TIF as an economic development tool fits into the entrepreneurial spirit of contemporary local economic development programs” (Briffault 2010, 67). There is a perception among local governments that incentive packages have a substantial influence over whether or not a business chooses to relocate or remain in a community (Man 1999).

Man (1999) used multiple regression analyses to identify factors that affect a city’s decision to adopt a TIF. The results of Man’s analysis suggest —a city’s probability of adopting

TIF is increases if neighboring cities implement TIF programs” (1163). Mason and Thomas (2010) reported that cities are 1.63 times more likely to adopt a TIF if adjacent to another city that has adopted a TIF. The likelihood of adoption is nearly twice as likely if an adjacent city has adopted a TIF for retail development purposes (Mason & Thomas 2010).

Not only do cities compete with other cities, but there is empirical evidence to suggest that neighborhoods within large cities compete with each other, as well. Gibson (2003) looked at the characteristics of neighborhoods in which TIFs are located in Chicago. Gibson looked at five potential reasons that affect the location of TIFs. Among the potential explanations was TIF adoption results from competition between communities. Gibson does provide a caveat. Though her findings were consistent with competitive adoption, TIF adoption patterns may be the result of diffusion of information.

TIF may increase in popularity “because information on the availability of TIF or the success of TIF diffuses over time” (Gibson 2003, 315). The case may be that in Chicago leaders took notice and began to advocate for TIFs as TIFs were established in neighboring wards. “This diffusion could lead to TIF’s increasing rate of use over time if a city becomes more convinced of its efficacy” (Gibson 2003, 315). A diffusion hypothesis is easily applied at higher levels of government. Just as neighborhood leaders advocate for TIFs, city leaders may adopt TIFs based on the perceived success of TIFs in neighboring municipalities.

Gibson’s diffusion hypothesis is worth considering especially in understanding the findings of Mason and Thomas (2010). Their regression analyses found that adjacency to a city that has adopted a TIF, not the number of miles, had a statistically significant effect on the likelihood of a city to adopt a TIF. “Being adjacent to a city with a TIF increases the number of TIFs approved by 1.01 TIFs” (176). This finding suggests that the knowledge of TIF use in

nearby municipalities is sufficient to motivate TIF adoption. For a city considering establishment of a TIF district, the number of miles a city is in proximity to a neighboring TIF does not seem to have a corresponding effect on the probability of TIF adoption. If distance measured in miles from neighboring TIFs does not follow a corresponding increase in likelihood of adoption, it is reasonable to conclude that TIF adoption is just as likely when a city within the same metropolitan statistical area adopts a TIF as when a municipality that shares a border adopts a TIF.

Hypothesis Two: Competitive Adoption

Research shows that competitive adoption increases the likelihood that a city will establish a TIF district. Referring back to the discussion fiscal federalism, both traditionalists and public choice theorists contend that fiscal federalism encourages competition among jurisdictions. Citizens and by extension corporations vote with their feet, and producing an attractive climate for both business and people is a primary motivator of local government policy.

Economic development incentives like tax increment financing are used to encourage economic development; the literature shows that competition between municipalities for economic growth increases the likelihood of TIF adoption. This research asks does competitive adoption also impact the size of TIF districts adopted? Based on fiscal theory and findings in previous research, this study predicts that neighboring TIF adopting municipalities will have a positive impact on the size of TIFs.

H2: Municipalities located within the same county or an adjacent county where a TIF district has been previously established will adopt TIFs that are larger in size.

TIF as a Mechanism of Revenue Capture

Of real concern for scholars and local leaders is the dynamic between the TIF-enacting government and local government units that have overlapping tax authority. Overlapping jurisdictions, most notably school districts, tend to be hostile to TIF adoption. ~~“~~Their resentment to TIF derives from their perception that they have lost‘ their own revenue and have to spend more to cover increased local service costs generated by development or redevelopment in the TIF district” (Man 2001, 5). The assessed value of all property within the proposed TIF district is frozen at the time of adoption. Not only is the property value from which the municipal government derives revenue frozen, but property values are frozen for school districts and other local government units, as well.

Critics argue that the structure of TIFs may encourage municipal governments to ~~“~~capture” revenue from overlapping jurisdictions to subsidize economic development (Dye & Merriman 2006). Whether revenues are unfairly captured depends on whether TIFs cause economic growth or follow economic growth (e.g. TIF is applied to relatively healthy areas or areas that would be developed anyhow) (Fernandez 2003).

What results is essentially an argument over which came first—the TIF district or economic growth. If a TIF district resulted in economic growth that would not have occurred otherwise, then it is fair that overlapping jurisdictions share in the costs (Dye & Merriman, 2006). On the other hand, if a TIF is established in an area where future growth is already expected, then the TIF merely acts as a siphon, ~~“~~stealing” resources away from other jurisdictions. Determining causality is extremely difficult.

Though Anderson (1990) demonstrated that property values did grow at a faster rate in cities that adopted TIFs, he cautioned that it is impossible to tell whether the TIF district was the cause of the predicted growth. Anderson concluded that TIF property value growth has a positive

effect on TIF adoption. It is possible that local officials may adopt TIFs ahead of expected economic growth. There is some indirect evidence to support this claim. Cities with growing populations are more likely to adopt TIF plans than cities with declining populations (1990). Growing populations would suggest increased economic activity, and cities may establish TIFs due to an increase demand for services caused by population growth (1990). Where TIFs are established within a city may also provide evidence of revenue capture.

Byrne (2006) examined TIFs at the neighborhood level in Chicago and found evidence that TIFs were established to stimulate economic development in disadvantaged areas. However, there was evidence of abuse. “Twenty-five percent of the TIF districts studied were in areas that had median incomes at least \$3,113 greater than those in the municipality as a whole” (323). Some TIFs were established in neighborhoods that likely would not meet the strict definition of “blighted”. Though TIF may work to siphon resources from other jurisdiction, the burden imposed is passed to those individuals who reside outside the municipality.

Tax increment financing allows municipal governments to shift tax burdens across taxing jurisdictions (Skidmore & Kashian 2010). A municipal government may be inclined to establish TIF districts in order to capture expected property value growth from other local governmental units, but the net effect does not necessarily result in lower revenues for overlapping jurisdictions. The burden is felt by individuals who reside outside the municipality. “Someone who resides just outside a municipality will experience an increase in his/her aggregate tax rate, and additional revenues will go to cover the cost of subsidizing development in the TIF designated area” (413). Furthermore, Huddleston (1986) asserts since multiple municipalities within the same county may establish TIF, some cities would receive more in subsidy than they pay, while others would be negatively impacted.

Hypothesis 3: Revenue Capture

Cities may use TIF districts to capture revenue from local governments that have overlapping tax jurisdiction. This research seeks to explain whether or not an impulse to capture revenue from overlapping jurisdictions influences the size of TIFs adopted by municipal governments. If cities are motivated to establish TIF districts to capture revenue from overlapping jurisdictions in order to subsidize development, then it may be the case that TIFs with more participating tax units tend to be larger in size than TIFs with fewer participating tax units.

H3: Municipalities with a higher number of participating overlapping jurisdictions will adopt TIFs that are larger in size.

The Effects of Fiscal Stress

Local governments may establish TIFs in response to fiscal stress. Local taxes, intergovernmental revenues, and user fees are the primary sources of revenue for municipal governments (Johnson & Man 2001). However, intergovernmental transfers decreased during the 1980s and 1990s. During the same time period, TIFs grew in popularity and the number of states with legislation authorizing the creation of TIF grew. “The share of total federal aid going to local governments declined from twenty-eight percent in 1978 to about twelve percent in 1991” (90). While a draw down in intergovernmental transfers puts a strain on local governments, hostility towards taxes on the part of voters also causes fiscal stress.

According to Rodden (2006, 19), only those economic restrictions that citizens are willing to pay for will survive. Citizens tend to be hostile toward taxation. The 1980s saw widespread resentment towards taxation, particularly property taxes. So called taxpayer revolts like Proposition 13 resulted in voter imposed limits on property taxes, which left municipalities in California burdened with finding additional sources of revenue (Johnson & Man 2001). Due to

voter hostility, it was unlikely that cities could enter into development projects as bond elections to finance projects would have to be approved by a majority of voters. TIF allows local governments to sidestep voters, as establishment of a TIF is not subject to voter referendum (Johnson 2001). TIF immunity to debt limits also makes it an attractive tool.

TIF debt is not subject to municipal debt limits (2001). As a result, cities that have high debt ratios or have substantial outstanding general obligation debt may be more inclined to create tax increment financing districts. Additionally, the self-financing aspect of TIF may also encourage adoption in municipalities that are financially strained. In theory, TIF acts as a closed circuit. Incremental revenues generated from growth in captured property values pay for the public expenditures, which stimulate private investment (Briffault 2010). There is empirical evidence to suggest fiscal stress may play a role in TIF adoption.

Cities with lower average property value growth are more likely to adopt TIF (Anderson 1990). Cities faced with sluggish property value growth are faced with the dilemma of either raising property tax rates or finding alternative revenue sources. It is unlikely that alternative revenue sources like sales tax will exist as low property value growth may be a sign of low overall economic growth. Gibson (2003) found that Chicago area TIFs were largely targeted at economically distressed neighborhoods, because no private market incentive to develop in these areas existed. Per capita income also influences TIF adoption. Cities with higher per capita incomes are less likely to adopt a TIF (Man 1999). What the evidence shows is that cities that are strong economically are generally not as receptive to TIF adoption as cities that are experiencing fiscal stress whether due to poor debt management or poor economic performance.

The Effects of Path Dependency

Man (1999) and Mason and Thomas (2010) both found that municipalities were more likely to adopt TIF districts if they had engaged in other economic development tools like property tax abatements or rehabilitation programs. Furthermore, research shows that municipalities not only seem more willing to adopt TIFs in their own districts, but also respond to the use of development incentives in neighboring jurisdictions.²⁴ Adjacency to neighboring municipalities that actively use development tools like TIF puts significant pressure on policy makers to do the same lest their cities appear less competitive or business-friendly. Once a city has begun using economic development incentives, it is more likely to continue using them in the future. This could be the result of familiarity or a sense of necessity.

Hypothesis Four: Path Dependency

Cities that have previously adopted TIFs are found to be more likely to adopt them in the future. Once policymakers have become familiar with the mechanics of TIF and provided they see satisfactory results, the probability that they will adopt TIFs in the future increases. It is also possible that as policymakers become more familiar with the workings of TIFs, the size and scope of future TIFs may grow.

H4: Municipalities that have previously established TIFs will adopt TIFs that are larger in size.

Conceptual Framework Table

The hypotheses are summarized and linked to the literature in the conceptual framework *Table 3.1*. Conceptual frameworks bring coherence to all aspects of the research project—purpose, literature, theory, method, and results (Shields & Tajalli 2006, 330). Not only does the

²⁴ See (Byrne 2005); (Li 2006); (Reese 2006)

conceptual framework connect these various parts and provide guidance throughout the process, it also provides clarity and transparency to the scholarly research process as a whole.

Table 3.1: Conceptual Framework: Linking the Hypotheses to the Literature	
Research Purpose: The purpose of this research is to examine the factors that influence the size of tax increment financing districts (TIFs) adopted by municipal governments in the state of Texas.	
Hypotheses	Literature
H1: Municipalities located in counties with higher rates of unemployment will adopt TIFs that are larger in size.	Davis 1989; Anderson 1990; Man & Rosentraub 1998; Donaghy, Elson, Knaap 1999; Dye & Merriman 2000; Bhatta, Merriman, Weber 2003; Byrne 2006; Carroll and Eger 2006; Dye & Merriman 2006; Bhatta, Merriman, Weber 2007; Briffault 2010; Byrne 2010; Merriman, Skidmore, Kashian 2011
H2: Municipalities located within the same county or an adjacent county where a TIF district has been previously established will adopt TIFs that are larger in size.	Tiebout 1956; Oates 1994; Man 1999; Man 2001; Gibson 2003; Byrne 2005; Ambrosanio & Bordignon 2006; Quigley & Rubinfeld 2007; Briffault 2010; Mason & Thomas 2010; Mikesell 2011
H3: Municipalities with a higher number of participating overlapping jurisdictions will adopt TIFs that are larger in size.	Huddleston 1986; Anderson 1990; Man 2001; Gibson 2003; Fernandez 2004; Byrne 2005; Byrne 2006; Dye & Merriman 2006; Skidmore and Kashian 2010;
H4: Municipalities that have previously established TIFs will adopt TIFs that are larger in size.	Byrne 2005; Li 2006; Man 1999; Mason & Thomas 2010; Reese 2006

While previous studies have investigated specific factors as determinants of TIF adoption, these same factors are used to see if there is an influence on the actual size of TIFs in acreage. The attempt here is to determine, not if a set of variables influence whether a city chooses to adopt a TIF, but if these same variables observed in previous studies have an influence on the magnitude of TIF adoption, which is measured through the actual size of the individual TIF districts established.

Conclusion

While five dynamics of tax increment financing were discussed (economic development, competitive adoption, revenue capture, fiscal stress, and path dependency) only four factors serve as the foundation for the hypotheses articulated in Chapter Three. This research seeks to answer whether the same factors that influence whether or not a city adopts a TIF also influence the size of the TIF itself. Specifically, this research tests whether or not economic stress, interjurisdictional competition, the potential for revenue capture, and conditions of fiscal stress influence the size of tax increment financing districts. It was predicted that economic stress, competitive adoption, potential for revenue capture, and path dependency has a positive effect on the size of TIFs adopted by Texas municipalities.

Chapter Four: Methodology

Chapter Purpose

As discussed in Chapter Three, a review of the scholarly literature on tax increment financing found that economic stress, the presence of other TIF adopting municipalities (*competitive adoption*), the number of overlapping jurisdictions participating (*potential for revenue capture*), and path dependency have a positive impact on the likelihood of TIF adoption.

Four operational hypotheses were developed in Chapter Three about the relationship between the factors of TIF adoption identified and the size of TIF districts adopted in Texas. This chapter explains how the four hypotheses were tested and how the variables were operationalized. Aggregate data analysis is used to determine whether or not the independent variables articulated in the operationalization table affect the size in acres of TIFs adopted by Texas municipalities.

Design

This study uses existing data gathered from several government sources. Using existing data is beneficial especially given the time constraints of this project. Ordinary Least Squares regression is used to explain the relationship between the dependent variable and the independent variables. Multiple regression analysis is an ideal statistical technique for multivariate analysis. It is also ideal because multiple regression analysis allows the research to account for control variables or rival hypotheses. The unit of analysis in this study is individual TIFs adopted by city governments in Texas between 1990 and 2011.

Operationalization

The four factors that affect the size of tax increment financing districts were measured by the county unemployment rate in the year the TIF was created; a yes/no dummy variable whether or not the adopting municipality is in proximity to other municipalities that have adopted TIFs in the same or an adjacent county; the number of overlapping jurisdictions participating in the TIF district; and a yes/no dummy variable whether or not the municipality has adopted a TIF district in the past or not. *Table 4.1* outlines how the variables were operationalized, and it identifies the relationship, whether positive or negative, each of the independent variables has to the dependent variable.

Dependent Variable

The dependent variable in this analysis is the size of each TIF district as measured in acres. Municipalities are required to report information on each TIF district within its jurisdiction to the state comptroller's office. The report requires that each TIF's size be recorded, and the standard of measure used is acreage. Therefore, the dependent variable for this study uses the size of each TIF in number of acres.

Independent Variables

Four independent variables used in this study are: the county unemployment rate; whether neighboring municipalities have established TIF districts; the number of overlapping jurisdictions participating in TIF districts, and whether the municipality has previously adopted TIF.

Table 4.1: Operationalization Table			
Variable	Direction of Change	Definition	Data Source
Dependent Variable			
Size of TIF District in Acres		Size of TIF district measured in acres	2002-2012 TIF Registries ²⁵ Authorizing municipal ordinances TIF information provided on individual municipal websites
Independent Variable			
H1: County Unemployment Rate	+	County unemployment rate for year TIF is adopted measured as a percentage of labor force that is unemployed	US Bureau of Labor and Statistics ²⁶ (Years 1990-2010)
H2: Municipality neighbors other municipalities that have adopted TIF districts	+	Score of either 0 if municipality does not neighbor city that has adopted TIF or 1 if municipality reside or is adjacent to a county where other municipalities have previously adopted TIFs	2002-2012 TIF Registries
H3: The number of participating overlapping jurisdictions	+	Numerical score representing the number of taxing jurisdictions participating in TIF district. Range is 0-8.	2002-2012 TIF Registries
H4: Municipality has adopted TIF previously	+	Score of either 0 if municipality has not previously adopted TIF or 1 if municipality has previously adopted TIF.	2002-2012 TIF Registries

²⁵ TIF Registries can be accessed at the following links: **2002-** http://www.texasahead.org/tax_programs/increment_finance/if_reports/2002-Biennial-Report.pdf; **2004-** <http://www.window.state.tx.us/taxinfo/proptax/registry04/zone.html>; 2006- <http://www.window.state.tx.us/taxinfo/proptax/registry06/finance.html>; **2008-** <http://www.window.state.tx.us/taxinfo/proptax/registry08/>; **2010-** <http://www.window.state.tx.us/taxinfo/proptax/registry10/>; **2012-** http://www.texasahead.org/reports/TIF_Abatement/2012/registry.pdf

²⁶ County Data tables can be accessed at: <http://www.bls.gov/lau/>

The county unemployment rate is the operational variable that measures the impact that economic stress has on the size of TIF districts created by Texas municipalities. The county unemployment rate of the county within which the TIF-adopting municipality is geographically located is measured as a percentage provided by the US Bureau of Labor Statistics, and this study uses the county unemployment rate for the year the TIF was adopted.

The presence of neighboring municipalities that have established TIFs operationalizes the factor of competitive adoption, and it is measured using a dummy variable, where a score of 1 is assigned if a municipality within the same county has previously established a TIF or a municipality in an adjacent county has previously established a TIF, and a score of 0 is assigned if a municipality does not neighbor a TIF-adopting municipality.

The number of overlapping jurisdictions participating in the TIF district measures the factor of revenue capture, and it is measured as a numerical score of 0, 1, 2, 3 etc. A Score of 0 is given if the only taxing jurisdiction affected is the municipality in which the TIF is located.

Whether the municipality has previously adopted a TIF is used to measure an effect of path dependency. Previous TIF adoption is measured as a dummy variable where a score of 1 is assigned if the city has previously adopted a TIF and a score of 0 if it has not previously adopted a TIF.

Data Source

Since 2002, all municipal governments are required to report information on each TIF to the State Comptroller. The State Comptroller's office publishes a TIF Registry in a report titled, *Biennial Reports of Reinvestment Zones for Tax Abatement Registry, Tax Abatement Agreement Registry, Tax Increment Financing Zone Registry, and Refund for Economic Development*. This report is published every two years on even numbered years. Data provided in the 2002 through

2012 Biennial Reports was used, because the state does not require municipalities to report on TIFs each year. For example, while information on TIF districts in San Antonio were recorded in the 2008 Biennial Report, they were not, however, reported in the 2010 Biennial Report. In order to ensure the most complete data set, all reports since the state began collecting TIF data in 2002 were used in this study. The 2002 through 2012 registries represent all active TIF districts in Texas in the years 2001 through 2011.

County unemployment data was collected from tables of yearly labor force data by county provided by the US Bureau of Labor Statistics (BLS). Tables are provided for as far back as 1990. Since 1990 is the earliest year available, the few cases of TIFs adopted prior to 1990 were precluded from the statistical analysis. The entire data set is provided in *Appendix 1*.

In cases where data was missing, attempts were made to ascertain the missing values by accessing TIF reports on individual city websites²⁷. For example, the sizes of over half of the TIFs established in the city of Dallas were not provided in any TIF Registry. The size of each TIF was gathered from the marketing brochures provided on the Dallas Economic Development website. However the availability of such information varies widely from city to city. Many city websites were not nearly as thorough, and as such limited the number of cases used in the statistical analysis. In cases where TIF literature was unavailable on city websites, information regarding TIF size was found in the individual city ordinance establishing the TIF district.

As of 2011, there were approximately 223 active TIFs in Texas. However, given the presence of missing data, a sample size of 174 was used in the statistical analysis. The sample represents all active TIFs for which a complete data set was available. As noted, only TIF districts established between 1990 and 2011 were used. The year 1990 is the earliest year that the

²⁷ Sources are available on request in cases where TIF data was collected outside of the TIF Registries provided by the State Comptroller.

county unemployment rate is available on the BLS website, and the year 2011 is the latest year for which TIF data is reported to the Texas State Comptroller and published in the 2012 TIF Registry.

Limitations of Study

This study was limited in several ways. First, the TIF Registry published by the State Comptroller's office is not an exhaustive list. Idiosyncrasies in reporting allow for some TIFs to be recorded one year and absent the next. Furthermore, data inconsistencies were discovered throughout the course of this research, which hampered accurate measurement, and as the state only required yearly reporting since 2002, there is no data available on TIFs that expired prior to the first year the TIF Registry was published in 2002.

The most significant limitation to this study is self-selection bias. In this case, municipalities choose whether to adopt TIFs or not making truly experimental design impossible. A comparison group, which would strengthen this quasi-experimental study, was not applicable given the nature of the research question. The creation of the TIF was a foregone conclusion. What this research sought to examine were the possible factors that influence the size.

Conclusion

This chapter presented the research design and the hypotheses tested, and it articulated how the variables were operationalized. The sample was identified as well as the statistical procedure to be used. Chapter Five presents the results of the statistical analysis.

Chapter Five: Results

Purpose

The purpose of this chapter is to explain the results of the statistical analysis to determine whether economic stress, competitive adoption, revenue capture, and path dependency have a significant effect on the size of TIF districts. This chapter displays the results of the OLS regression in graph and table form. The regression model tested whether a relationship exists between the dependent variable (the size of TIF districts) and the four independent variables (unemployment rate, the number of overlapping jurisdictions contributing, whether or not the TIF adopter neighbors other municipalities that have adopted TIF, and whether or not the city has established TIFs in the past).

Descriptive Statistics

Table 5.1 and *Table 5.2* display the descriptive statistics of the sample. The sample size was $n=174$. Two outliers were excluded from the analysis as both had studentized residual scores greater than ± 3 . Descriptive statistics are provided for the dependent and independent variables. The mean size of TIF districts in the sample is 709 acres. The standard deviation for TIF size is quite larger ($SD=826.73$) indicating that the size of TIF districts are highly variable. TIF districts are created for a multitude of projects and in practical terms can be as small or large as needed.

Table 5.1: Descriptive Statistics

	<i>M</i>	<i>SD</i>	Min	Max
Size of TIF in Acres	709.18	826.73	4.43	3617.0
Duration of TIF	25.33	6.28	10	41
County Unemployment Rate	5.06	1.38	1.70	9.10
Participating Overlapping Jurisdictions	1.75	1.49	0	8
Number of Neighboring TIF Adopters	5.69	6.32	0	24
Observations	174			

Table 5.2: Descriptive Statistics of Dummy Variables

	<i>n</i>	<i>Percentage</i>
Neighboring TIF Adopters		
Yes	156	89.7%
No	18	10.3%
Previous TIF Adopter		
Yes	104	59.8%
No	70	40.2%

The only real limitation on TIF district size specified in the authorizing statute is that a TIF district may not contain property that cumulatively exceeds 15% of real property within the municipality. While this provides a maximum size of any individual TIF, the combined property values of all TIFs within any given city may indeed exceed 15%, though such a circumstance would be extremely rare. To provide perspective, one square mile is approximately 640 acres. Beyond the statutory limit of 15%, there are no limitations on size and TIF districts may be created for projects as small as a few city blocks, to a 30-acre residential development, to as many as a several hundred acre downtown redevelopment project.

The unemployment rate was less variable (mean of 5.06% and a standard deviation of 1.38). As this study encompasses nearly 22 years of data and encompasses TIF districts from varying geographical areas of Texas facing varying economic conditions, it is not unusual that there may be some variability in the unemployment rate; however unemployment rates do not frequently experience large fluctuations.

Descriptive statistics for the dummy variables show that the majority of TIF districts (89.7%) are located in municipalities that neighbor other TIF-adopting municipalities. Only 10.3% of TIFs are located in municipalities where no other TIF districts are found in other cities within the residing county or any adjacent counties. Additionally, 59.8% of municipalities are previous TIF adopters.

Regression Analysis

Tests for homoscedasticity and multicollinearity found that these assumptions were not violated, and the results are provided in *Appendix 2* at the end of this study. The results show that the four independent variables together explain 6.1% of variation in TIF size as shown in *Table 5.3*. One variable was found statistically significant at the 0.1 level. One of the four variables was found statistically significant at the .05 level, and one variable was found statistically significant at the .01 level. The county unemployment rate was significant at the 10% level, and whether or not a municipality had previously adopted TIF was significant at the 5% level. Whether the municipality neighbors TIF-adopting municipalities was significant at the 1% level. The number of overlapping jurisdictions participating was not statistically significant. Path dependency (whether the municipality had adopted TIF in the past) accounted for the greatest amount of variation and was the strongest predictor in this model.

The coefficient for county unemployment was 92.87. This means that for each 1% increase in county unemployment, the size of TIF districts adopted between 1990 and 2011 increased by about 93 acres. The coefficient for neighboring TIF-adopters was 505.9. Municipalities that neighbor other TIF-adopting cities establish TIF districts that are on average 506 acres larger than municipalities that do not neighbor TIF-adopting cities. Finally, a coefficient for path dependency was -377.64. TIF districts were 378 acres smaller on average in municipalities that had previously adopted TIFs than in municipalities adopting TIF for the first time. Beta coefficients show that previous TIF adoption had the strongest impact on the size of TIF districts adopted by Texas cities.

Table 5.3: Regression Model Results

	B	Std. Error	β
Independent Variable			
County Unemployment Rate	92.87*	46.96	.155
Participating Overlapping Jurisdictions	66.93	42.24	.121
Neighbor TIF Adopting Municipalities	505.91**	209.79	.187
Previous TIF Adoption	-377.64***	128.50	-.225
Observations	174		
Constant	-105.87		
Adjusted R Squared	0.061		
F Statistic	3.822***		

* Significant at $\alpha < .10$; ** Significant at $\alpha < .05$; *** Significant at $\alpha < .01$

* Dependent Variable = Size of TIF in Acres

Though three of the four variables were shown to be significant, the predictive power of this regression model is relatively weak. The four variables tested account for approximately 6% of the variance in TIF size. Referring back to the literature, these results demonstrate some consistency between the same factors of TIF adoption identified in the literature and the factors of TIF size. While economic stress, competitive adoption, and path dependency increase the likelihood of TIF adoption, the results of this study suggest that these same factors also have a positive, albeit weak, impact on the size of the TIFs adopted.

That the number of overlapping jurisdictions participating was not shown to have a statistically significant impact on the size of TIF districts was not surprising. As pointed out in Chapter Two, one of the unique conditions of TIF adoption in Texas is that overlapping jurisdiction participation is completely voluntary. The lack of forced participation negates any revenue-capture motivation. The impact of neighboring TIF-adopting municipalities should be interpreted carefully. It could certainly be evidence of competitive adoption, but it may also be a function of awareness. Decision makers may be more likely establish TIF districts after observing TIF use in neighboring cities. People may be more likely to adopt TIF as the practice becomes more common.

The most surprising result was not that path dependency that path dependency was significant, but that previous TIF adoption actually had a *negative* impact on TIF size. This is likely due to factors not used in this study. It is likely that the size of individual TIF districts is more a matter of the particular needs or circumstances of the proposed project. One might expect to find TIF districts more narrowed or uniquely tailored to particular projects in cities that are frequent TIF adopters and more expansive in first time adopters. Also, remembering the statutory limit on TIF size, such limitations would preclude frequent TIF-adopters from adopting increasingly larger districts.

Conclusion

This chapter presented the results of the multiple regression analysis. It was found that economic stress and neighboring TIF-adopting municipalities have a positive effect on the size of TIF districts adopted by Texas municipalities. Path dependency (whether or not the municipality has adopted TIF in the past) has a negative impact on TIF Size. The number of overlapping jurisdictions had no significant impact on the size of TIF districts. This research is concluded in Chapter Six with some reflections on this study and suggestions for future inquiry.

Chapter Six: Conclusion

Research Summary

The purpose of this research was to explain the factors that influence the size of tax increment financing districts in Texas. Chapter One explained how TIF works and presented the benefits and criticisms of TIF adoption. Chapter Two articulated the setting of this research and explained the mechanics of TIF specific to Texas. Chapter Three provided a broad overview of fiscal federalism theory and review of the scholarly literature on tax increment financing. Chapter Four described the methodology used and operationalized the hypotheses tested in the study. Chapter Five presented the results of two multiple regression models. This chapter assesses the findings of this study and suggests further research. *Table 6.1* summarizes the hypotheses and findings of this study.

Table 6.1: Summary of Findings

Hypothesis	Statistical Significance	Impact on TIF Size
H1: Municipalities located in counties with higher rates of unemployment will adopt TIFs that are larger in size.	Statistically Significant	Positive Impact
H2: Municipalities located within the same county or an adjacent county where a TIF district has been previously established will adopt TIFs that are larger in size.	Statistically Significant	Positive Impact
H3: Municipalities with a higher number of participating overlapping jurisdictions will adopt TIFs that are larger in size.	Not Statistically Significant	No Impact
H4: Municipalities that have previously established TIFs will adopt TIFs that are larger in size.	Statistically Significant	Negative Impact

Assessment of Findings

The findings indicate that previous TIF adoption was statistically significant at the 1% level and had a negative impact on TIF size. The county unemployment rate was significant at the 10% level and had a positive impact TIF size. Additionally, neighboring TIF-adopters had a positive impact on the size of TIF districts and was statistically significant at the 5% level. The number of overlapping jurisdictions participating was not statistically significant. This research suggests that TIFs tend to be larger the higher the unemployment rate at time of adoption and if the adopting municipality neighbors other TIF-adopting cities. However, TIFs tend to be smaller in cities that have previously adopted TIF districts versus first-time adopters.

The results do not support is the assertion that the dynamic of revenue capture identified in the literature is occurring. It is the opinion of the researcher that the revenue capture motive is not a factor. The statutes governing TIF creation in Texas make it unlikely that any coercive revenue capturing is taking place due to the fact that non-municipal governments in Texas are allowed to decide whether they participate in TIFs and if so, to what degree. Any relationship is likely reverse causality—the number of potential participants limits the scope (i.e. size of the TIF project).

Though the county unemployment rate, neighboring TIF-adopters, and path dependency were found to be significant, the model only accounted for 6% of the variance. This model is exceptionally weak and there are more significant factors that influence the size of TIFs that were not included in this model. These findings suggest that while the independent variables used in this study are good predictors of whether or not a municipality chooses to adopt TIFs, they are weak measures in determining the characteristics of the TIFs adopted. Additionally, further research would help in explaining the negative relationship between previous TIF adoption and TIF size.

Limitations of Study

This study was limited in several ways. First, the TIF Registry published by the State Comptroller's office is not an exhaustive list. Idiosyncrasies in reporting allow for some TIFs to be recorded one year and absent the next. Furthermore, data inconsistencies were discovered throughout the course of this research, which hampered accurate measurement, and as the state only required yearly reporting in 2002, there is no data available on TIFs that expired prior to the first year the TIF Registry was published in 2002.

In relation to the data limitations, a variable measuring fiscal stress was not included in this study. Such information would require collection from the comprehensive annual financial reports (CAFRs) of individual cities. The TIF districts in the sample span a 20-year time frame. It is unlikely that many cities would have data for TIFs created certainly before the year 2000 readily available. Unfortunately, the time allowed for this project made such collection impossible. However, the data provided in city CAFRs presents a wealth of information. Heavy reliance on CAFRs would have produced a much smaller sample, but likely a more complete sample with more robust results.

Suggestions for Further Research

Though this study found a weak relationship between TIF size and the independent variables used, identifying factors that influence the size of TIFs is still a worthy pursuit. The reason this researcher chose the four independent variables he did was to try and establish some linkage between the motivations of TIF adoption as defined in the literature and the resulting composition of the adopted TIFs. Other factors such as whether or not the land is developed or undeveloped, whether the TIF is developer-driven, zoning composition of the TIF, and various

measures of fiscal stress may be worth investigating. Unfortunately, collection of the needed data was impractical given the time constraints of this project.

A more extensive study could not be pursued given the time constraints of this research project, but a much more meaningful endeavor would be to try and replicate the work of previous scholars on the factors that influence TIF adoption. Man (1999) used a probit regression model to determine likelihood of TIF adoption and found that the rate of change in state aid, the rate of change in the property tax rate, average income, and neighbors' use of TIF, were statistically significant in determining the likelihood of TIF adoption in municipalities in Indiana. Like Man's work, the bulk of TIF research has focused on states in the Great Lakes Region. Replication of Man's work in a southern state like Texas would strengthen the literature on TIF adoption.

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Appendix 1: TIF Data

County	City	Year of Adoption	Duration	Size in Acres	County Unemployment Rate	Overlapping Jurisdictions Participating	Neighboring TIF adopters	Neighboring TIF Adopter Dummy	Previous TIF Adopter	Previous TIF Adopter Dummy
AUSTIN	Sealy	1993	22	58.0068	4	1	0	0	No	0
BEE	Beeville	1986	20	58.0068	NA	4	0	0	No	0
BELL	Temple	1982	40	12800	NA	7	0	0	No	0
BELL	Killeen	2008	20	2100	5	2	3	1	Yes	1
BELL	Belton	2004	20	2885	5.3	1	2	1	No	0
BEXAR	Selma	2002	23	477.901	5.8	2	2	1	No	0
BEXAR	San Antonio	2004	20	35.01	5.8	2	1	1	Yes	1
BEXAR	San Antonio	2002	15	48.829	5.8	2	1	1	Yes	1
BEXAR	San Antonio	2004	16	65.65	5.8	2	1	1	Yes	1
BEXAR	San Antonio	2004	20	13.688	5.8	1	1	1	Yes	1
BEXAR	San Antonio	1998	10	10.9	3.9	4	1	1	Yes	1
BEXAR	San Antonio	2004	25	40.587	5.8	1	1	1	Yes	1
BEXAR	San Antonio	2004	25	47.002	5.8	1	1	1	Yes	1
BEXAR	San Antonio	1998	20	30.396	3.9	4	1	1	Yes	1
BEXAR	San Antonio	2001	24	9.82	4.7	2	1	1	Yes	1
BEXAR	San Antonio	2004	25	101.06	5.8	1	1	1	Yes	1
BEXAR	San Antonio	2001	25	39.006	4.7	1	1	1	Yes	1
BEXAR	San Antonio	2006	25	88.1	4.7	1	1	1	Yes	1
BEXAR	San Antonio	1998	20	140.2	3.9	2	1	1	Yes	1
BEXAR	San Antonio	2000	25	172.9	4.1	2	1	1	Yes	1
BEXAR	San Antonio	2002	24	443.9	5.8	2	1	1	Yes	1
BEXAR	San Antonio	1999	14	86.8	3.3	2	1	1	Yes	1
BEXAR	San Antonio	2006	26	194	4.7	0	1	1	Yes	1
BEXAR	San Antonio	2004	20	524.35	5.8	0	1	1	Yes	1
BEXAR	San Antonio	2008	20	459.4	4.8	0	2	1	Yes	1

BEXAR	San Antonio	1999	13	629.248	3.3	3	1	1	Yes	1
BEXAR	San Antonio	1999	26	812.132	3.3	4	1	1	Yes	1
BEXAR	San Antonio	2006	20	698.58	4.7	0	1	1	Yes	1
BEXAR	San Antonio	2000	15	956	4.1	0	1	1	Yes	1
BEXAR	San Antonio	2008	25	1542	4.8	0	2	1	Yes	1
BEXAR	San Antonio	2008	20	2113	4.8	0	2	1	Yes	1
BEXAR	San Antonio	2004	25	2500	5.8	0	1	1	Yes	1
BEXAR	San Antonio	2007	30	3100	4.2	3	1	1	Yes	1
BOWIE	Texarkana	2009	25	173	6.6	0	0	0	No	0
BOWIE	Texarkana	2009	25	868	6.6	0	0	0	No	0
BRAZORIA	Angleton	2005	NA	NA	5.7	1	10	1	No	0
BRAZORIA	Alvin	2004	30	541	6.9	0	9	1	Yes	1
BRAZORIA	Iowa Colony	2010	40	956	8.9	1	10	1	Yes	1
BRAZORIA	Manvel	2004	30	584.22	6.9	0	9	1	Yes	1
BRAZORIA	Manvel	2010	40	2403	8.9	1	10	1	Yes	1
BRAZORIA	Pearland	1998	30	3467	6.2	3	3	1	No	0
BRAZOS	College Station	1988	20	437.87	NA	2	0	0	No	0
BRAZOS	Bryan	2007	NA	NA	3.7	1	1	1	Yes	1
BRAZOS	Bryan	2005	NA	NA	4.2	1	1	1	Yes	1
BRAZOS	Bryan	2006	NA	NA	4	1	1	1	Yes	1
BRAZOS	College Station	2006	21	141.94	4	1	1	1	Yes	1
BRAZOS	Bryan	1998	20	352	1.7	2	1	1	Yes	1
BRAZOS	Bryan	2000	25	816.93	3.7	1	1	1	Yes	1
CAMERON	Brownsville	2004	30	289	8.8	1	0	0	No	0
CAMERON	La Feria	2007	30	757	6	1	3	1	No	0
COLLIN	Lavon	2006	30	NA	4.3	1	15	1	No	0
COLLIN	Allen	2005	25	122	4.6	1	12	1	No	0
COLLIN	Plano	1998	20	148	2.1	3	4	1	No	0
COLLIN	McKinney	2010	30	947	7.3	1	20	1	No	0
COLLIN	Melissa	2005	30	644	4.6	1	12	1	No	0

COLLIN	Prosper	2008	37	803.16	4.6	0	15	1	No	0
COLLIN	Plano	1999	20	125	2.1	0	4	1	Yes	1
COLLIN	Frisco	1997	41	1203	2.3	3	1	1	No	0
COLLIN	Allen	2006	20	885	4.3	0	15	1	Yes	1
COLLIN	McKinney	2010	30	3617	7.3	1	20	1	No	0
COMAL	New Braunfels	2007	25	492	3.6	1	3	1	No	0
DALLAS	Dallas	1988	20	300	NA	4	0	0	No	0
DALLAS	Sachse	2003	NA	NA	7.4	0	20	1	No	0
DALLAS	Mesquite	1997	20	112.75	4.2	1	5	1	No	0
DALLAS	Dallas	1996	16	110.5	4.6	4	1	1	Yes	1
DALLAS	Dallas	2005	30	5.6	5.6	1	15	1	Yes	1
DALLAS	Dallas	1992	20	300	7.3	4	0	0	Yes	1
DALLAS	Dallas	2009	25	486	8.2	1	24	1	Yes	1
DALLAS	Dallas	1992	20	247	7.3	3	0	0	Yes	1
DALLAS	Dallas	2005	22	125	5.6	1	15	1	Yes	1
DALLAS	Dallas	1998	20	72	3.8	3	3	1	Yes	1
DALLAS	Dallas	2005	22	182.4	5.6	1	15	1	Yes	1
DALLAS	Farmers Branch	1999	20	154	3.6	4	9	1	Yes	1
DALLAS	Dallas	1992	20	450	7.3	4	0	0	Yes	1
DALLAS	Dallas	2005	30	228	5.6	1	15	1	Yes	1
DALLAS	Dallas	2005	22	245.7	5.6	1	15	1	Yes	1
DALLAS	Farmers Branch	1998	20	1000	3.8	6	4	1	No	0
DALLAS	Dallas	1998	15	43	3.8	0	3	1	Yes	1
DALLAS	Dallas	2005	30	626	5.6	2	15	1	Yes	1
DALLAS	Dallas	2007	22	448	4.6	1	17	1	Yes	1
DALLAS	Mesquite	1998	20	383.57	3.8	1	12	1	Yes	1
DALLAS	Carrollton	2006	25	1047	5.2	0	20	1	No	0
DALLAS	Dallas	2007	32	585.78	4.6	1	17	1	Yes	1
DALLAS	Grand Prairie	1999	20	1588	3.6	8	9	1	No	0
DALLAS	Richardson	2006	25	1217	5.2	1	16	1	No	0

DALLAS	Mesquite	1999	25	538	3.6	1	13	1	Yes	1
DALLAS	Rowlett	2002	30	1737.76	7.4	0	13	1	No	0
DALLAS	Dallas	2005	22	1167	5.6	1	15	1	Yes	1
DALLAS	Dallas	2010	30	1661	8.8	1	24	1	Yes	1
DALLAS	Dallas	2008	30	1167	5.4	1	23	1	Yes	1
DALLAS	Irving	1998	20	3390	3.8	3	4	1	No	0
DALLAS	Grand Prairie	1999	20	3579	3.6	5	9	1	No	0
DALLAS	Grand Prairie	1999	20	4468	3.6	4	9	1	No	0
DENTON	Little Elm	2008	30	249	4.5	0	20	1	No	0
DENTON	Lewisville	2001	28	215	3.5	1	11	1	No	0
DENTON	Little Elm	2008	30	491	4.5	0	20	1	No	0
DENTON	Lewisville	2008	30	112.5	4.5	1	20	1	Yes	1
DENTON	Flower Mound	2005	20	1465	4.6	1	16	1	No	0
ELLIS	Waxahachie	2002	20	2344	5.8	0	11	1	No	0
ELLIS	Midlothian	1998	31	2673	3.7	3	3	1	No	0
ELPASO	El Paso	2006	30	188.42	6.7	0	0	0	No	0
FORTBEND	Sugarland	1998	25	32.83	2.9	2	3	1	No	0
FORTBEND	Rosenberg	1999	10	5	3.2	1	3	1	No	0
FORTBEND	Sugarland	1998	25	339	2.9	3	3	1	No	0
FORTBEND	Missouri City	1999	30	595.54	3.2	3	3	1	No	0
FORTBEND	Missouri City	2007	30	596	4.1	4	8	1	Yes	1
FORTBEND	Hitchcock	1999	20	850.658	3.2	2	8	1	No	0
FORTBEND	Sugarland	2007	30	839.4	4.1	1	8	1	Yes	1
FORTBEND	Missouri City	1999	30	2158	3.2	2	3	1	No	0
GALVESTO	Galveston	2001	40	128.87	5.2	3	4	1	No	0
GALVESTO	League City	1999	20	712	6.7	2	3	1	No	0
GALVESTO	Galveston	2003	40	464	7.2	3	4	1	Yes	1
GALVESTO	Texas City	2006	32	3457.7	4.8	2	8	1	No	0
GALVESTON	League City	2003	29	NA	7.2	0	4	1	Yes	1
GALVESTON	Galveston	2001	30	40	5.2	3	4	1	No	0

GALVESTON	Galveston	2001	30	128.87	5.2	3	4	1	No	0
GALVESTON	League City	2000	20	355	4.9	1	3	1	Yes	1
GRAYSON	Sherman	2002	20	118.5	6.7	0	3	1	No	0
GRAYSON	Sherman	2006	25	82.41	4.9	0	5	1	Yes	1
GRAYSON	Sherman	2005	20	165	5.4	0	3	1	Yes	1
GUADALUPE	Schertz	1993	20	NA	3.6	2	0	0	No	0
HARRIS	LaPorte	1999	30	NA	4.8	2	3	1	No	0
HARRIS	Houston	1995	29	300	6.1	5	0	1	Yes	1
HARRIS	Houston	1994	30	443	6.9	4	0	1	Yes	1
HARRIS	Houston	2003	30	80.42	6.8	0	5	1	Yes	1
HARRIS	Houston	1990	40	125.2	5.2	1	0	0	No	0
HARRIS	Houston	1996	20	112	5.6	1	0	1	Yes	1
HARRIS	Houston	2003	30	219.86	6.8	0	5	1	Yes	1
HARRIS	Houston	1998	30	94	4.4	2	1	1	Yes	1
HARRIS	Houston	1999	30	66	4.8	1	3	1	Yes	1
HARRIS	Houston	1997	25	247	5.2	2	1	1	Yes	1
HARRIS	Houston	1997	30	252.58	5.2	2	1	1	Yes	1
HARRIS	Houston	1999	30	120	4.8	1	3	1	Yes	1
HARRIS	Nassau Bay	2007	30	485	4.3	0	11	1	No	0
HARRIS	Houston	1998	30	108	4.4	1	1	1	Yes	1
HARRIS	Houston	1999	30	241	4.8	1	3	1	Yes	1
HARRIS	Houston	1999	30	515	4.8	1	3	1	Yes	1
HARRIS	Houston	1997	30	751	5.2	1	1	1	Yes	1
HARRIS	Houston	1997	30	847	5.2	2	1	1	Yes	1
HARRIS	Houston	1996	25	1075	5.6	1	0	1	Yes	1
HARRIS	Houston	1999	30	1010	4.8	1	3	1	Yes	1
HARRIS	Houston	1999	30	988	4.8	0	3	1	Yes	1
HARRIS	Houston	1997	30	1883	5.2	2	1	1	Yes	1
HARRIS	Houston	1999	30	2052	4.8	0	3	1	Yes	1
HARRIS	Houston	1998	30	3000	4.4	4	1	1	Yes	1

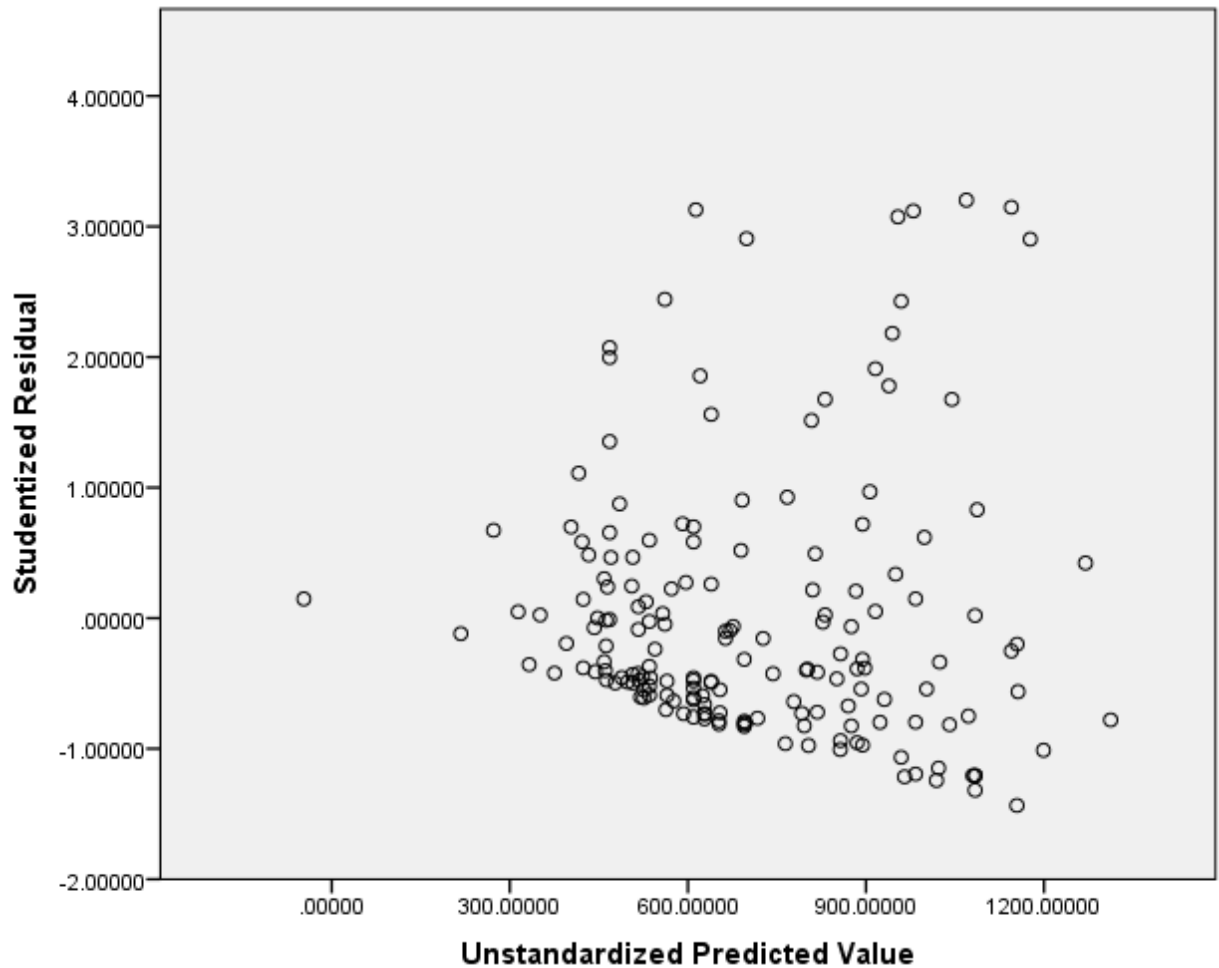
HAYS	San Marcos	2005	30	577	4.5	1	2	1	No	0
HIDALGO	Mercedes	2008	25	NA	NA	0	8	1	No	0
HIDALGO	Edinburg	2008	30	NA	7.3	1	8	1	Yes	1
HIDALGO	Alton	2009	25	NA	10.4	1	8	1	No	0
HIDALGO	Alamo	2008	25	NA	7.3	0	8	1	No	0
HIDALGO	Hidalgo	2008	NA	NA	7.3	1	8	1	No	0
HIDALGO	Donna	2006	25	28	7.4	1	3	1	No	0
HIDALGO	Edinburg	2007	30	127.993	6.6	1	1	1	No	0
HIDALGO	Penitas	2004	30	713	9.1	1	2	1	No	0
HIDALGO	Donna	2008	25	1500	7.3	1	8	1	Yes	1
HIDALGO	Mission	2001	30	6684.6	9.7	1	0	0	No	0
HOCKLEY	Levelland	2006	25	370	4.2	1	0	0	No	0
HOCKLEY	Levelland	2009	20	792	6.7	2	0	0	Yes	1
JEFFERSON	Beaumont	1982	NA	NA	NA	0	0	0	No	0
JOHNSON	Cleburne	2001	20	NA	4.4	1	8	1	No	0
JOHNSON	Cleburne	2002	NA	NA	6	1	8	1	Yes	1
KAUFMAN	Terrell	2007	20	NA	4.7	1	13	1	No	0
LUBBOCK	Lubbock	2001	40	NA	3.7	3	0	0	No	0
LUBBOCK	Lubbock	2002	30	NA	4.4	3	0	0	Yes	1
LUBBOCK	Lubbock	2009	30	586	3.6	3	1	1	Yes	1
MCLENNAN	Waco	1982	40	2388	NA	3	1	1	No	0
MCLENNAN	Waco	1983	40	72	NA	3	1	1	Yes	1
MCLENNAN	Waco	1988	40	301	NA	3	1	1	Yes	1
MIDLAND	Midland	2001	30	449	3.8	3	0	0	No	0
MONTGOME	Conroe	2001	16	NA	4	0	1	1	No	0
MONTGOME	Conroe	2001	27	NA	4	1	1	1	Yes	1
NAVARRO	Corsicana	2001	20	2374	5.5	2	1	1	No	0
NUECES	Corpus Christi	2009	NA	NA	6.7	2	1	1	Yes	1
NUECES	Corpus Christi	2000	NA	NA	5.3	3	0	0	No	0
PALOPINTO	Mineral Wells	2009	20	NA	7.7	0	1	1	No	0

POTTER	Amarillo	2006	30	1162	4.2	3	0	0	No	0
ROCKWALL	Rockwall	2004	38	113.1	5.3	1	7	1	No	0
SANPATRICIO	Ingleside	2007	30	1278	4.9	1	0	0	No	0
SMITH	Lindale	1996	10	190	6.5	1	0	0	No	0
SMITH	Tyler	1998	20	1100	5.2	3	1	1	No	0
SOMERVALE	Glen Rose	1998	NA	NA	7.5	3	0	0	No	0
STARR	Roma	2007	NA	NA	10.7	1	4	1	No	0
TARRANT	Benbrook	2002	NA	NA	NA	0	11	1	No	0
TARRANT	Grapevine	1996	20	NA	4	4	1	1	No	0
TARRANT	Grapevine	1998	32	NA	3.4	1	4	1	Yes	1
TARRANT	Arlington	2006	20	NA	4.7	3	14	1	Yes	1
TARRANT	Arlington	2007	30	NA	4.3	0	15	1	Yes	1
TARRANT	Burleson	2001	20	33	4.5	3	10	1	No	0
TARRANT	Colleyville	1999	20	6.9	3.2	4	10	1	No	0
TARRANT	North Richland Hills	1998	20	42	3.4	4	4	1	No	0
TARRANT	Fort Worth	1995	30	407	5	5	1	1	No	0
TARRANT	Fort Worth	2002	33	63.3	6.1	4	11	1	Yes	1
TARRANT	Fort Worth	2003	20	225	6.3	4	16	1	Yes	1
TARRANT	Arlington	1998	20	355	3.4	4	4	1	No	0
TARRANT	Arlington	2005	20	58	5.1	3	14	1	Yes	1
TARRANT	Burleson	2005	20	4.43	5.1	1	14	1	Yes	1
TARRANT	Southlake	1997	20	573.921	3.6	4	2	1	No	0
TARRANT	Fort Worth	2004	20	405	5.6	3	16	1	Yes	1
TARRANT	North Richland Hills	1999	20	42	3.2	3	10	1	Yes	1
TARRANT	Fort Worth	2003	40	824	6.3	4	16	1	Yes	1
TARRANT	Fort Worth	2006	20	604	4.7	4	17	1	Yes	1
TARRANT	Keller	1998	20	1100	3.4	4	4	1	No	0
TARRANT	Fort Worth	2004	20	981	5.6	4	16	1	Yes	1
TARRANT	Fort Worth	1995	40	1489.82	5	2	1	1	No	0
TARRANT	Fort Worth	2007	20	1100	4.3	4	18	1	Yes	1

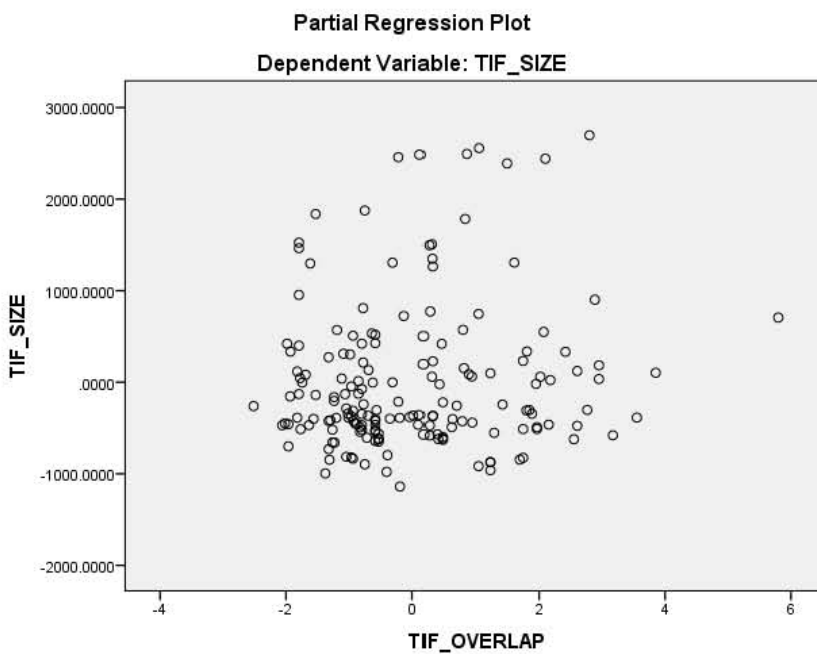
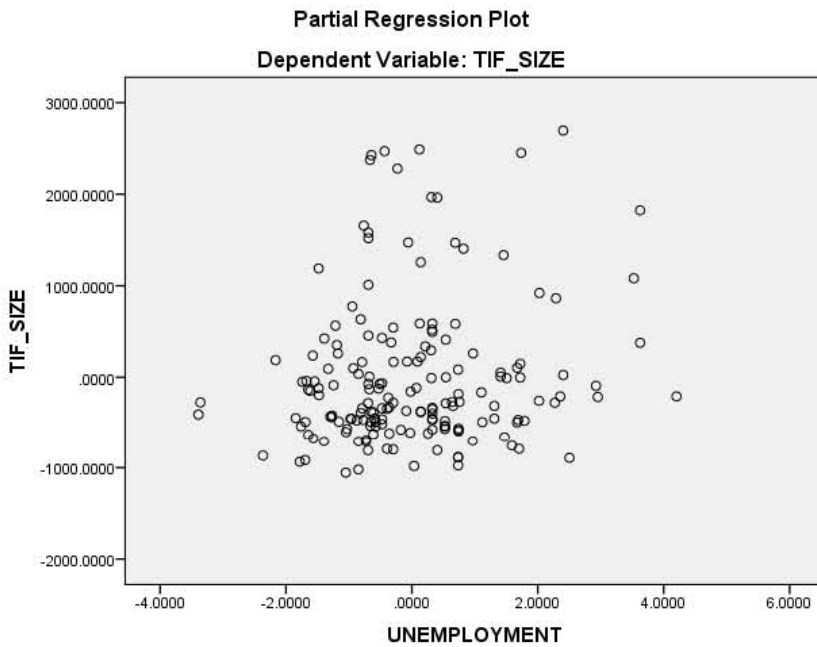
TARRANT	Fort Worth	1997	25	1400	3.6	5	1	1	Yes	1
TARRANT	Fort Worth	2003	15	2008	6.3	3	16	1	Yes	1
TRAVIS	Austin	2000	30	NA	3	0	0	0	No	0
TRAVIS	Austin	2008	30	NA	4.3	0	3	1	Yes	1
TRAVIS	Pflugerville	2010	31	399	6.9	0	3	1	No	0
TRAVIS	Austin	2008	20	126	4.3	1	3	1	Yes	1
TRAVIS	Austin	2004	40	700	5.2	0	1	1	Yes	1
VALVERDE	Del Rio	2005	25	NA	NA	1	0	0	No	0
WALLER	Katy	1997	20	NA	NA	1	1	1	No	0
WILLIAMS	Georgetown	2008	NA	NA	4.6	0	3	1	Yes	1
WILLIAMS	Georgetown	2007	NA	NA	3.7	0	3	1	Yes	1
WILLIAMS	Taylor	2005	25	128	4.5	1	3	1	No	0
WILLIAMS	Georgetown	2003	30	128	5.7	0	0	0	No	0
WILLIAMS	Georgetown	2004	25	66	4.7	0	0	0	Yes	1
WISE	Bridgeport	2007	30	640	4.2	1	8	1	No	0
WITCHITA	Burkburnett	2006	20	NA	4.4	1	1	1	No	0
WITCHITA	Wichita Falls	2005	20	650	4.7	2	0	0	No	0

Appendix 2: Testing of Assumptions

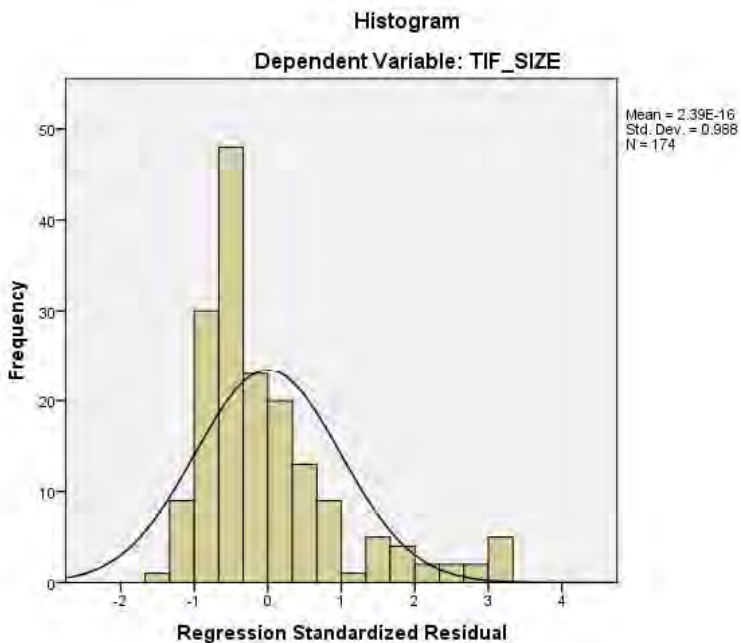
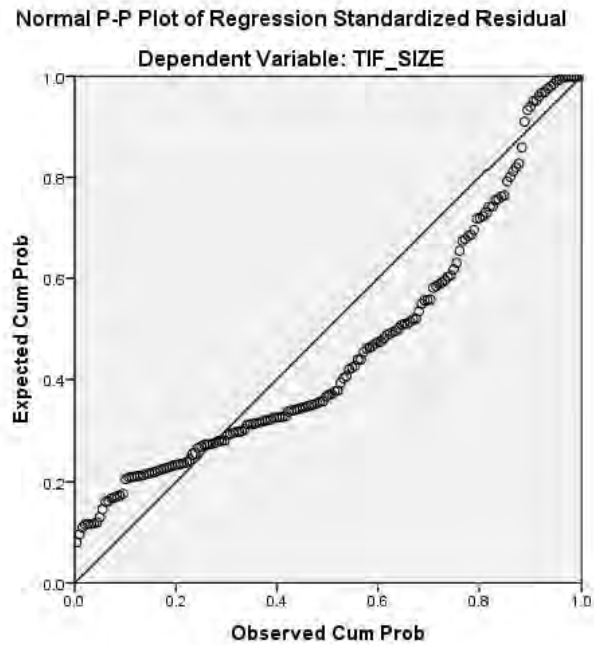
The studentized residuals were plotted against the unstandardized predicted values to check for a linear relationship. The residuals form a horizontal band; therefore the relationship between the TIF size and the independent variables is likely to be linear. Additionally, the spread of the residuals does not increase or decrease as you move across the predicted values. There is homoscedasticity.



The partial regression plots also show a linear relationship between the dependent and independent variables.



The P-plot shows that the residuals deviate from the normal distribution and the histogram indicates that the residuals are negatively skewed. However, regression analysis is fairly robust to deviations from normality, so no attempts were made to transform the variables.



The correlation table shows that none of the independent variables have a correlation greater than 0.7; therefore there is no multicollinearity. All tolerance levels are greater than 0.1. This indicates that collinearity is not present.

Correlations

		TIF Size	County Unemployment	Overlapping Jurisdictions	TIF Neighbors	Previous TIF Adoption
Pearson Correlation	TIF Size	1.000	.065	.104	.114	-.174
	County Unemployment	.065	1.000	-.252	-.194	.100
	Overlapping Jurisdictions	.104	-.252	1.000	.058	-.050
	TIF Neighbors	.114	-.194	.058	1.000	.222
	Previous TIF Adoption	-.174	.100	-.050	.222	1.000
Sig. (1-tailed)	TIF Size	.	.195	.087	.114	-.174
	County Unemployment	.195	.	.000	.005	.094
	Overlapping Jurisdictions	.087	.000	.	.058	-.050
	TIF Neighbors	.067	.005	.224	.	.002
	Previous TIF Adoption	.011	.094	.258	.002	.
N	TIF Size	174	174	174	174	174
	County Unemployment	174	174	174	174	174
	Overlapping Jurisdictions	174	174	174	174	174
	TIF Neighbors	174	174	174	174	174
	Previous TIF Adoption	174	174	174	174	174

The following cases were removed from the regression model to minimize the impact of outliers on the results:

Casewise Diagnostic

Case Number	Std. Residual	TIF Size	Predicted Value	Residual
93	3.623	4468.0000	1064.273623	3403.726377
156	5.611	6684.6000	1413.673979	5270.926021