

PLANNING FOR GROWTH IN CITIES AND METROPOLITAN REGIONS:
AN EMPIRICAL STUDY OF IMPACT FEES
AND CHOICE

by

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Presented to the Faculty of the Graduate School of
The University of Texas at Arlington in Partial Fulfillment
of the Requirements
for the Degree of

DOCTOR OF PHILOSOPHY

THE UNIVERSITY OF TEXAS AT ARLINGTON

December 2007

ACKNOWLEDGEMENTS

First and foremost, I devote all of the glory of this dissertation to God for giving me ability and persistence. I have many people to thank for their support. I am great indebted to Dr. Goldsteen for his encouragement, suggestions, and guidance over my years of graduate school. His innumerable reviewing, editing and advising were vital to the development and completion of this dissertation. His wisdom and knowledge inspired me. He has been a nurturing, inspiring and hardworking advisor and friend during my studies at the UTA. I appreciate your time and effort on my behalf.

I couldn't forget Dr. Hissong's assistance when I came to SUPA for the first time. He has spent helping me figure out collection data and talking through research problems. His comments and feedback were integral to the finalization of this dissertation. I cannot thank him enough for all of the hours to my graduate advisor, committee member, and friend. I would also like to thank Dr. Li for her support and feedback on the development of my dissertation. Her knowledge and assistance are highly appreciated. I want to thank Dr. Barrett for my graduate studies. She has spent helping and advising me on writing skill to pass comprehensive examinations. She in particular has been a valuable mentor to me throughout my graduate career. I appreciate them all of the time and attention for me.

Finally, professors and graduate students in the School of Urban and Public Affairs at the University of Texas at Arlington, as well as my parents and family, provided significant encouragement and support throughout my years of graduate school.

December 7, 2007

ABSTRACT

PLANNING FOR GROWTH IN CITIES AND METROPOLITAN REGIONS: AN EMPIRICAL STUDY OF IMPACT FEES AND CHOICE

Publication No. _____

Chi-Hyoung Park, Ph. D.

The University of Texas at Arlington, 2007

Supervising Professor: Joel B. Goldsteen

This research examines what city factors relate to the likelihood of adopting impact fees by local governments within metropolitan regions using data from the U.S. Census Bureau. More and more cities are adopting different types of impact fees for financing public facilities and infrastructure to accommodate their cities' growth without full understanding of issues, public and private criticisms of impact fees, and the empirical information needed. This dissertation investigates a random sample of 278 cities out of 827 cities populations over 25,000 located within 97 MSAs to understand what variables within their settings relate to impact fee adoptions using five categories such as forms of local government, geo-demography of city, housing, local financial

conditions, and local economic conditions. Statistical associations indicate that: impact fee adoption relates to 1) forms of local government, 2) geo-demographic characteristics of cities; 3) housing policies; 4) local financial conditions; and, 5) characteristics of local economic conditions. Each statistical result supports the overall characteristics of cities that adopt impact fees. Conclusions add to the debate and help clarify the importance of different city characteristics tending toward adoption of impact fees.

SUMMARY OF RESEARCH NEED, APPLICATIONS, AND METHODS

There is a need to currently assess the adoption of impact fees with regard to the method of financing infrastructure for expected urban growth across cities lying within all U.S. metropolitan regions. The use of development impact fees as alternatives for increasing revenue is argued in the literature review, explaining that fiscal stress on local governments led to their widespread adoptions. This research explores growth and other factor to explain about adopting, using, and applying impact fees as a growth management tool (Bowman, 1988; Taylor, 1991; Jeong & Feiock, 2006). Public Choice theory (Buchanan and Tullock, 1962; Ostrom, 1973; Blewett & Nelson, 1988; Stretton & Orchard, 1994; Brueckner, 1997; Pinch & Patterson, 2000; Sclar, 2000) is examined as local actors such as elected officials, interest groups, and existing, and new residents have participated in adopting impact fees to maximize their self-interests. That is, impact fee adoption has become a topic of debate of who should pay for new residential development (Blewett & Nelson, 1988; Ihlanfeldt & Shaughnessy, 2004; Judd & Swanstrom, 2004). Legal issues are discussed about the adoption of impact fee as local regulations on constitutional due process and equal protection guarantees. This research

will use primary and secondary nationwide data that has been previously unavailable. The method for this study uses a binary logistic regression model to explain what city variables affect the adoption of impact fees in U.S metropolitan areas.

BACKGROUND

According to U.S. Census Bureau data collected during the 1990s, 80.3 percent of U.S. population lived in metropolitan areas and the population change rate within metropolitan areas grew by 14 percent, while the non-metropolitan areas increased 10 percent (Perry & Mackun, 2001). Due to this trend of growth, most metropolitan local governments are inevitably faced with urban growth issues in financing their public facilities and infrastructure. Also, the decline of federal and state aid for infrastructures has stressed local governments to accommodate urban growth (Carrion & Libby, 2001). In order to solve local financial problems, development impact fees, as fiscal and regulation policy tools for urban growth management, are suggested (Frank & Downing, 1988; Nelson, 1988; Yinger, 1998; Ihlanfeldt & Shaughnessy, 2004).

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CHAPTER 1

INTRODUCTION

1.1 Statement of the Problem

Thousands of cities, including most counties in the U.S. Metropolitan Statistical Areas (MSAs), have serious financial problems in maintaining and improving their infrastructure (Hildreth, 1996; Levy, 2006). Due to the decline of Federal and State aid and the resistance to any kind of property taxes, many local governments have relied on other sources of revenue, such as development impact fees, to finance their public facilities and infrastructure during their population growth (Evans, 2000; Jeong, 2004). Generally, the perceived decrease in adequate infrastructure is blamed and the deficiency of infrastructure has put fiscal pressure on local governments within a balanced-budget constraint (Evans, 2000; Pagano, 2002; Jeong, 2004).

Urban growth of the past decade has caused most local governments to increase spending on both general revenues and capital facilities (Pagano, 2002). Pagano argues that the average annual growth of local governments' general fund expenditure had been 1.99 percent between 1993 and 2000, whereas the average growth rate for capital spending was 7.8 percent per year during the same period. That is, local governments are facing with spending a significant portion of general revenues to finance public facilities and infrastructure for urban growth.

Because local governments had depended on federal and state funds as supplements Carrion and Libby (2004), some argue that they have had continual problems with financing infrastructure (i.e. roads, bridges, sewage treatment plants) to support new development. Now, most all of them face serious reductions of federal and state funds; that is, a significant portion of the financing of infrastructure has shifted from state and federal government to local governments such as cities, townships, villages, and counties forcing them to seek alternatives. Also, existing residents resisted higher property taxes to provide the current level of public good and services or to financing new infrastructure (Simmonds, 1993). Nelson and Moody (2003) argue that property taxes increasingly fail to cover the full costs of the infrastructure needed to serve new development because there are statutory limits on annual increases (Jeong, 2004). As cities grow, local governments must develop new financial tools to meet the increased infrastructure costs and demands. As a popular financial tool, impact fees can provide for coordinated infrastructure for new development (Washington Research Council, 2001). Even so, debates over the adoption of local impact fee policies and their effectiveness continue.

1.2 Purpose of the Study

The purpose of this study is to explore what characteristics of cities affect the adoption of impact fees in U.S. metropolitan areas. The needed amount of public investment in local infrastructure is endangered by serious cutbacks from higher-level governments, and local governments do not increase their revenues. Also, local governments tend to avoid raising taxes and promote alternative methods of increasing

revenues. Failure to finance public facilities and infrastructure can ruin a local fiscal authority and shrink public infrastructure presented to its residents. That is, local governments seek or create their own fiscal policies to finance public facilities and infrastructure (Green & Fleischmann, 1989; Pagano, 2002; Carrion & Libby, 2004; Jeong, 2004) state that. Therefore, the way that impact fees are determined and applied are important because development impact fees may cover the full or partial costs of public facilities and infrastructure and are subject to state statutes.

Local fiscal policies created a fierce competition among cities to finance public facilities and infrastructure (Bowman, 1988; Taylor, 1991; Jeong & Feiock, 2006). According to the Tiebout (1956), municipal competition can be explained as a factor that working in favor of attracting new residents and enhancing the quality of life. That is, residents want to move from one city to another by considering local services and goods such as infrastructure, public facilities, and school systems. Feiock (1991) argues that local economic decisions have intensified in response to the urban fiscal crises of the mid-1970s and the economic downturns in the early 1980s. Also, he suggests that local governments apply economic policies designed to enhance their economic well-being. That is, local fiscal policies to promote local economic development is stimulated because local governments must raise most of the revenues from local residents and business to support public goods and services (Nelson & Moody, 2003). Thus, local governments have usually considered impact fee adoption to attract people, businesses and firms for creating jobs and tax bases. As a matter of local fiscal autonomy, local governments have the power to impose impact fees on developers and builders for new

development. This power allows local governments to discreetly raise revenues to provide public facilities and infrastructure such as roads, water and sewer, and bridges; that is, growth- accommodating cities are different from controlled growth cities in their approach to private investments.

Accordingly, more research is needed to uncover the characteristics of cities of U.S. metropolitan regions that adopt impact fees in five specific areas: 1) forms of local government; 2) geo-demographic characteristics of cities; 3) housing; 4) local financial conditions; and 5) local economic conditions. First, the forms of local government consist of two independent variables such as manager system or mayor-council system and home rule authority. Local politics between the two systems can make a significant difference in policy decision processes, and home rule charter may also provide motivations and constraint for local decision-makers. Second, the geo-demographic characteristics of cities consist of size of population, population growth, city age, and regions. Even though previous research directly connect population growth to impact fee adoptions, this dissertation contains more geo-demographic characteristics of cities than the previous studies to explain impact fee adoptions in U.S. MSAs. Third, housing characteristics of cities consist of dwelling unit permits, housing affordability, and housing median value growth. Urban growth raises the most significant concerns of newly constructed houses and the consequent increased demand for new infrastructure constructions and/or the expansion. Fourth, local financial conditions consist of public facility expenditure and per capita debt expenditure. Urban growth has affected local governments to increase spending on public facilities and infrastructure; accordingly,

they intend to rely on debt financing for providing or maintaining public facilities and infrastructure. Last, local economic conditions consist of median household income growth, employment growth, and unemployment change. Inadequate infrastructure brings significant costs such as user's time and money. Worsening of public infrastructure and deficient capacity for future growth will restrain local economic development, while improved public infrastructure with impact fees may promote local economic conditions. Accordingly, a comprehensive understanding of the overall characteristics of cities will be useful factors for adopting impact fees to manage desirable urban growth or control urban sprawling development.

1.3 Significance of the Study

Adopting impact fees results from a series of decisions based on policy and legal considerations (Carrion & Libby, 2004). In policy considerations, impact fee adoption applies Public Choice theory to explain local actors' behaviors such as elected officials, interest groups, and existing, and new residents for maximizing their self-interests (Buchanan & Tullock, 1962; Ostrom, 1973; Blewett & Nelson, 1988; Stretton & Orchard, 1994; Brueckner, 1997; Pinch & Patterson, 2000; Sclar, 2000; Joeng, 2004; Jeong & Feiock, 2006). Impact fee adoption is argued to create inequities, because developers and builders transfer infrastructure costs to new residents; that is, those who bear the burden of the cost of infrastructure related to impact fee adoption (Blewett & Nelson, 1988; Carrion & Libby, 2004; Ihlanfeldt & Shaughnessy, 2004; Judd & Swanstrom, 2004). Also, local governments may adopt impact fees to meet infrastructure competition in metropolitan areas (Bowman, 1988; Taylor, 1991; Jeong &

Feiock, 2006). From a legal perspective, Carrion and Libby (2004) mention that impact fees must meet the constitutional tests such as a substantive due process test and an equal protection test; that is, impact fee adoption must meet rational nexus tests to the constitutional.

Also, impact fee adoptions relate to urban growth in light of providing public facilities and infrastructure. Due to cities' growth, understanding the affective characteristics of cities in the five specific areas is important for improving public policy decision to explain the advantages and disadvantages of adopting impact fees. These overall characteristics of cities which influences to impact fee adoption are constantly evolving. This research also analyzes the literature of local fiscal policy more detail on impact fee adoption using public agency data. The study will suggest the more productive distribution and management of impact fees for financing infrastructure. The results of this research will be important because local governments can finance public facilities and infrastructure without distorting city revenue and provide better public services without increasing residents' property tax burden.

1.4 Chapter Summaries and Study Framework

In Chapter 1, the statement of the problem and the purpose of the study are stated. Then, significance and framework of the study are stated. The next Chapter 2 reviews a literature review of impact fees. This chapter provides urban growth and accommodation and the examples of Florida, California, and Texas as the fast growing states having impact fees to explain about adopting, using, and applying impact fees as a growth management tool. Also, Chapter 3 provides a theoretical framework of impact

fee adoption. This chapter consists of two divisions: policy considerations and legal considerations. In Chapter 4, data, hypotheses, and methods and data analysis techniques will be discussed. The data analyses and findings are discussed in Chapter 5. Finally, conclusions, discussion, and further research needed are stated in Chapter 6.

CHAPTER 2

LITERATURE REVIEW OF IMPACT FEES

2.1 Impact Fees

According to Kolo and Dicker (1993), impact fees were originally called exactions when cities were seeking new infrastructure financing alternatives in the 1920s. They mention that a traditional exaction is the construction of facilities or donation of land. If there was not land within new development areas for dedication of a facility, other land could be donated, or a development fee accepted in lieu of a dedication (Delany, 1987). Exaction is a provision in the development approval process. Exactions include (1) land donated for a park, school, fire station, (2) physical improvements on site (completed park, storm water ponds), (3) physical improvements off site (turn lanes), and (4) cash payments that go into a fund utilized to purchase land for open space, parks, schools, etc. Exactions have a long history of requiring developers to provide some sort of targeted gift or donation in order for a proposed development to be approved (Dresch & Sheffrin, 1997). Kolo and Dicker (1993, p. 199) argue that “development exactions have evolved from land dedication to impact fee through a slow process.”

Impact fees have evolved from the exaction process (Listokin, 1990, p. 109). Listokin says that many local governments required private developers to furnish land for public use such as parks, squares, commons, and even, more expensive private land

donation for streets, sewer, and infrastructure in the nineteenth and early twenty centuries. By the 1940s and 1950s, local governments appeared to change a new type of development exaction because mandatory dedication was proved inadequate. If a community had already enough land for public use, the community imposes an in-lieu-fee equivalent to the fair market price on developers instead of land dedication. By 1960s, 1970s, and 1980s, local governments required more expensive demands such as physical infrastructure –streets, water and sewer lines, sidewalks, wider cart-ways and rights-of-ways for the subdivision streets (Listokin, 1990). That is, impact fees are known as exactions for financial responsibilities, which local governments can impose on a developer and builder to provide some or the entire physical infrastructure such as sewers and streets to parks and schools necessitated by development and its impacts (Kolo & Dicker, 1993).

Impact fee is imposed on the developers or builders at the time of platting or building permit because developers and builders are associated with a major portion of the cost land development for roads, utilities, and other infrastructure (Peiser & Schwanke, 1992). That is, impact fees are a demand in the development approval process that requires developers and builders to give or provide something to a local government (Bosselman & Stroud, 1985). According to Carrion and Libby (2004), the use of impact fee is a practical tool to finance public facilities and infrastructure in the last decade in the U.S. An impact fee is a form of financial exaction to reduce the gap between the resources and the money to build new public facilities and infrastructure because residents resist higher property taxes in developing areas and federal and states

aids decline in local public infrastructure. Under the two aftermaths, many local governments turned to alternatives to fund public facilities and infrastructure. Impact fees are used to finance a variety of infrastructure (Juergensmeyer, 1988; Strauss & Leitner, 1988; Nicholas, Nelson, and Juergensmeyer 1991; Evans 2000).

Where exactions were limited to the development site; however, impact fees have an off-side development that is not limited to the development site (Listokin, 1990). That is, impact fees are for the financing of off-side capital improvements such as roads, sewers, water, parks, schools, parks, police, and other public facilities, located the perimeter of the development. Listokin (1990) says that even though impact fees stem from land dedications, they have mainly evolved from in-lieu fees because the impact fees approach is “who should pay growth?” regarding off-side development. Impact fees are levied on developers, builders, and new residents who are expected to benefit from new development. Accordingly, impact fees are evolved to secure additional revenues for local growth that should pay for itself based on pay-as-you-grow basis or on the basis of benefits received (Simmonds, 1993).

Today, impact fees finance infrastructure and public facilities on new developments assessed by local governments to recover all or part of the cost of infrastructure such as water utilities, sewer, roads, drainage, parks, schools, treatment plants, fire and police stations, and major transportation improvement (Nelson 1988; Nicholas, Nelson, & Juergensmeyer 1991; Evans 2000; Jeong 2004). Impact fees are known as capacity fees, facility fees, system development charges, capital recovery fees, Fees-in-Lieu, development taxes, and availability fees across U.S. cities (Jeong 2004;

Mullen 2005). Those fees are designed and spent to finance capital improvements such as water and sewer, storm water, roads, school, parks and highways to serve city growth. Even though there exist various types and names of impact fees across U.S. cities, Leithe and Montavon (1990) argue that three types of impact fees such as sewer/water, transportation, and parks were widely adopted by local governments.

According to 2005 National Impact Fee Survey, the property of impact fees is that “(1) they are charged only to new development, (2) they are standardized fees as opposed to ad hoc, negotiated payments and (3) they are designed and used to fund capital improvements needed to serve growth” (Mullen, 2005, p.1). Impact fees are a fiscal charge imposed by local government on new development (Nicholas & Nelson, 1988; Kolo & Dicker, 1993). That is, impact fees are one time charges applied to new development to raise revenue for the construction or expansion of infrastructure and public facilities (Nelson, 1988; Nicholas, et al., 1991; Evans, 2000; Jeong, 2004).

2.2 Growth Management versus Accommodation

The relationship between urban growth and impact fees has become a topic of research and study during past decades (Nelson, 1988; Nicholas, 1991; Jeong, 2004, 2006; Burchell, Downs, McCann, & Mukherji, 2005; Mookherjee et al., 2006). Urban growth is a basic unit concept needed to understand the adoption of impact fees. The variables comparing urban growth and suburbanization have led to population growth and population migration outward from the inner city (Levy, 2006). People have been reported to migrate to the suburban areas to seek better lives with lower densities and for better educational opportunities for their children (Fulton et al., 2001, p. 3). In these

conditions, urban growth has created local governmental fiscal stress to provide infrastructure. That is, the needed infrastructure stems from additional population growth, employment growth, and local economic development in a community (Delaware Valley Regional Planning Commission, 2004). Thus, local governments seem to prefer to adopt impact fees as an alternative revenue resource for financing infrastructure because residents resist higher local taxes such as property tax and federal or state funds for local infrastructure is limited for new development (Mathur, Waddell, & Blanco, 2004; Carrion & Libby, 2004).

Since the 1960s, it has become increasingly recognized that community growth results in certain significant costs (Burchell et al., 2005). An extensive body of urban studies' literature has been published that these quantify the costs of growth, and who pays those costs. Most of the cost of urban growth has focused on fiscal costs resulting from the need for expanded infrastructure and public services for new residents and business. In order to finance infrastructure in local governments, private sharing of public infrastructure costs such as impact fees developed from planning practices such as land dedications, exactions, cash payment and in-lieu fees (Jeong, 2004). Nelson (1988) argues that impact fee policy has been a popular financing mechanism for new infrastructure. Impact fees are exemplified as the most creative and innovative among new infrastructure financial tools for local governments (Kolo & Dicker, 1993; Lee, Johnson, & Joyce, 2004). Accordingly, local governments coordinate the financial burden of infrastructure under impact fee schedule for new development. That is, the financial burden of infrastructure for new development is supposed to be shared by the

public and private together under the impact fee schedule (Jeong, 2004).

Impact fees are an exercise of local fiscal regulation authorities in home-rule statutes or chapters, subdivision regulation power, zoning enabling legislation, and utility statutes (Stroud, 1988). Juergensmeyer (1991) says that impact fees are sometimes called regulatory impact fees because they must be tied to control the approvals of permits for new development. A properly created impact fee system begins with a good comprehensive plan backed up with an equally good capital improvements program (Nicholas, Nelson, & Juergensmeyer, 1991). For example, Florida, Texas, and California have adapted that municipal's land use plans require development impact fees to be tied to public facilities and infrastructure for new development.

In Florida, Jeong and Feiock (2006) point out, even though local property tax is still important tool as the major revenue source for local governments, Florida state regulation prevents local governments from increasing property taxes in Florida. Local governments are allowed to 10 mills as the maximum property tax millage rate in Florida. MacManus argues that 10-mil cap is hard for local governments with populations less than 50,000 to finance infrastructure for new development (MacManus 1998). He also mentions the Florida homestead property tax exemptions of \$ 25,000 value houses that make a difficulty for local governments to collect property taxes because the exemptions occupy 28.6 percent in Florida. That is, local governments cannot meet to local growth due to the limitation of raising property taxes under the state regulation. However, the Local Government Comprehensive Planning and Land Development Act of 1975 demands local governments prepare capital improvements

plans for the effects of comprehensive land use plan in Florida. The Act is amended in 1985, and related to revenue resources with impact fees to finance capital improvement plans for growth management with new development (Nicholas, Nelson, & Juergensmeyer, 1991).

According to Florida impact fee review task force (2006), approximately \$5.3 billion is impact fee revenues in Florida. They report that these impact fee revenues have rapidly increased due to population growth, the rising cost of land and building infrastructure, and the decreasing availability of state and federal funds for local infrastructure. The task force concluded “impact fees are a growing local source of revenue for infrastructure and local governments in Florida do not have adequate revenue generating resources with which to meet the demand for infrastructure within their jurisdictions”.

The limitation of property tax increases was an important factor in finding new funding sources for infrastructure in Florida. Accordingly, most local governments have adopted impact fees as local revenue resources for financing public facilities and infrastructure in Florida. Jeong and Feiock (2006), argue that even though existing residents had to pay for the costs of new infrastructure with increasing property taxes in greater taxpayer resistance, impact fees as an alternative resource are handy to collect for financing new infrastructure.

In Texas, Clarke and Evans (1999), say that the state legislation does not impose heavy obligations with higher impact fees on developers and builders for new developments. The state law also allows local governments to set up separate areas with

its own fee schedule for reflecting the actual cost of development in the areas. Gilliland, Krebs, and Vanderberg (1992) find that larger cities are more likely than smaller cities to adapt impact fees. The finding shows only 5 percent of the smaller cities and 37 percent of larger cities for adapting impact fees in the survey cities. In the survey, they argue that the smaller cities collected 90 percent of the cost of infrastructure and larger cities levied 55 percent of the cost of infrastructure on the adopted impact fees. That is, this finding proves a lack of consistency to the state law for following the guidelines with capital improvements plans.

Local governments must follow Chapter 395 of the Texas Local Government Code to adopt an impact fee ordinance (Texas Local Government Code Annex, Title 12, 395.001). Impact fees are charges on new developments assessed by local governments to recover all or part of the cost of providing public facilities and infrastructure such as water supply, treatment and distribution facilities; wastewater collection and treatment facilities; storm water, drainage and flood control facilities; and roadway facilities. In determining the scope of impact fee program, the chapter 395 of the Texas Local Government Code provides certain charges such as 1) construction contract price, 2) surveying and engineering fees, 3) land acquisition costs, including land purchases, court awards and costs, attorney's fees and expert witness fees, 4) fees actually paid or contracted to be paid to engineers and financial consultants preparing or updating the capital improvements plan and who is not an employee of the political subdivision, and 5) interest and other finance costs (if bonds, notes or other obligations are issued to finance the capital improvements or facility expansions). Also, the chapter 395 of the

Texas Local Government Code provides that impact fees may not be paid for certain items such as 1) projects and related costs of those projects that are not included in the capital improvements plan or facility expansions, 2) repair, operation and maintenance of existing or new capital improvements or facility expansions, 3) upgrading, updating, expanding or replacing existing capital improvements to serve existing development to meet stricter safety, efficiency, environmental or regulatory standards, 4) upgrading, updating, expanding or replacing existing capital improvements to provide better service to existing development, 5) administrative and operating costs of the impact fee program, 6) principal payments and interest or other finance charges on bonds or other indebtedness for projects not in the capital improvements plan, and 7) any roadway designated in the federal or Texas highway system. Adopting an impact fee ordinance is still a constrained process related to capital improvement plans for financing infrastructure because the Code prevents local governments from integrating impact fees into their general budgets with both the administration and application sides.

The Chapter 395 Capital Improvements Plan requires local governments to define an appropriate level of service. According to Chapter 395 05(a), local governments' ordinance has to adapt capital improvements plans with the following elements: administration of impact fees, time of assessment of the impact fees, time of collection of the impact fees, making provision for offsets and credits of impact fees, schedule of maximum fees and actual fees to be collected, accounting system for funds collected, and refund provisions. However, Gilliland and Ramseur (1990) discover that local governments didn't follow the guidelines for local impact fees ordinance to avoid

local governments' arbitrariness. Also, local governments have been slow to adopt fee structures in conjunction with capital improvement plan.

In California, when the voters of California approved Proposition 13, local governments faced with declining dramatically revenue from property taxes as a main local governments' income because a citizen initiative cut property taxes by more than half. The Proposition 13 forced local governments to turn out be the most important planning law in the state because local revenue sources are tied to land and real estate development (Barnebery, 1988). As a result, local governments have changed fees and exactions for new source of revenue, even though the cost of building the infrastructure and new facilities for new residential development was shared by all property taxpayers in local governments before Proposition 13 (Dresch & Sheffrin, 1997).

According to California Constitution Article XI, § 7, the power with impact fees stems from the local governments' authorities to protect the public health, safety, and welfare. The police power allows local governments to implement in the interest of its citizenry and to perform and enforce ordinances and regulations that are not in conflict with California state law. Also, California Constitution Article XI, § 5 reports charter cities have the additional power to regulate with respect to municipal affairs. Local governments have been collecting impact fees for many years since the California Mitigation Fee Act was approved in 1987. The Act was enacted that local governments required developers and builders to pay infrastructure improvement costs. In the Act, local governments levy impact fees on developers and builders to finance all or part of the cost of infrastructure and public facilities such as streets, roads, bridges, drainage

and flood control facilities, and water and sewer buildings. According to Landis et al. (2001), the average amount of impact fees was \$19,552 in 89 jurisdictions with impact fees policy, and these local governments were heavily dependant on impact fees to finance infrastructure with fees ranging from a low of \$6,783 to a high of \$47,742. That is, California local governments levy impact fees on developers and builders for the increasing costs of new development for infrastructure (Been, 2005). Leithe and Montavon (1990) say that even though the cost of infrastructure varies across states, California as the average of sixty percent is higher than other states. Proposition 13 with property tax limitations and rapid growth stimulate local governments to find other revenue resources such as impact fees in California.

These states' examples give local policy makers and planners the significant understanding of impact fee adoption to solve capital costs for urban growth because there is a need to adopt currently of impact fees with regard to the method of financing infrastructure with urban growth. However, capital costs for urban growth have still been a big problem into current dilemmas of local policy and planning practice to provide infrastructure for new development (Bruecker, 1997; Jeong, 2004; Burchell, Downs, McCann, & Mukherji, 2005). Urban growth generates a never-ending upward spiral of costs of growth because local governments spend tax monies to build new roads, highways, sewers, and schools to meet the need of new residents (Nelson, 1988). It is really difficult to solve the costs of urban growth without fundamental changes in public policies and planning. Although there are some answers such as smart growth, zoning or regional governance for urban growth, the current costs for urban growth has

more harmful things in local financial conditions (Burchell, Downs, McCann, & Mukherji, 2005) because local governments have to find other financial sources beyond property taxes and federal or state aids to provide new infrastructure such as highways, roads, sewer, and water plants for new residents. Although the adoption of development impact fees as alternatives for increasing revenue for urban growth is argued in the literature review, fiscal stresses on local governments have led to their widespread impact fee adoptions over 59 percent of U.S. cities for new development (GAO, 2000).

2.3 Housing and Impact Fees

Ihlanfeldt and Shaughnessy (2004) argue that there are two reasons in the adoption of impact fees for new residential developments. First, new residential development requires the tax burdens of existing property owners to finance public capital service and infrastructure by imposing the costs on developers and builders. Second, impact fees are more efficient and more equitable than alternative financing mechanisms because private investments reproduce marginal social costs and the fees are based on the benefit principle of just taxation. However, the increasing of impact fees affects housing prices and housing affordability in urban growth (Singell & Lillydahl, 1990; Altshuler & Gomez-Ibanez, 1993; Dresch & Sheffrin, 1997; Skaburskis and Qadeer, 1992; Skidmore & Peddle, 1998; Been, 2005; HUD, 2007).

According to Montavon (1990), the argument of impact fees has been found in new residential development because a major critique of impact fees is that they are not equitable in who pays impact fees related to residential development (Evans, 2000). Although local governments impose impact fees on builders and developers to shift the

burden of financing new infrastructure from the community at large (Huffman, Nelson, Smith, & Stegman, 1988,)), builders and developers don't want to pay the burden of infrastructure cost for new residential development. In this sense, Urban Land Institute (ULI, 1986) argues that infrastructure costs are paid by its "Fair Share" that new residents or homebuyers should pay for the portion of the costs. Also, the National Association of Home Builders (NAHB, 1984) argues that buyers of new housing will pay more due to impact fees added to price because impact fees are designed to impose the burden of new infrastructure costs on more new buyers than developers and builders for new residential development. Therefore, one of the arguments for impact fees is serious undermined by increasing the cost of housing in contemporary metropolitan areas (Wallis, 1996). Infrastructure costs for the residential development have led to the extensive impact fees on housing prices (HUD, 2007).

For example, the higher prices of housing have denied many people the opportunities to move into a good place because they cannot afford the higher housing costs produced by higher local impact fees (Wallis, 1996; Judd & Swanstrom, 2004). Higher impact fees may be a barrier in U.S. MSAs. For example, impact fees add to higher housing costs. According to Snyder & Stegman (1986), a Colorado Springs builder with an impact fee of \$ 6,170 imposed its impact fee burden on new buyers to \$7,900 on a \$75,000 house. This case suggests who ultimately pay the cost of the impact fee because the impact fee added to the cost of housing. In another example, Dresch and Sheffrin (1997) study the effects of impact fees on the price of housing for Contra Costa County with rapid growth in recent decades. They found that the effects of

impact fees on the price of housing within Contra Costa County. The finding is that “a \$1 increase in fees would raise housing prices by only \$0.25”. This meant that developers and landowners had \$0.75 burden in a \$1 increase in impact fees; that is, developers and landowners have approximately 75 percent in impact fees.

In recent impact fee research on the price of housing, Ihlanfeldt and Shaughnessy (2004) evaluate the effects of impact fees on the prices of new and existing single-family houses through time-series data sets for Dade County FL. Dade County began with adapting impact fee for road construction in 1989, and the impact fees have grown for parks, education, fire protection, and police protection. The research presents an additional of impact fees increases the price of both new and existing housing (Ihlanfeldt & Shaughnessy, 2004). They show the findings: 1) there is not statistically significant in the difference between new and existing housing on the effect of an additional dollar of real impact fees, 2) by shifting from property taxes to impact fees to finance public capital facilities and infrastructure, the increase in the price of housing equals the present value of the property tax savings because higher impact fees reduce millage rates (Ihlanfeldt & Shaughnessy, 2004, p. 658).

Mathur, Waddell, and Blanco (2004) provides new facts on the effects of impact fees on housing prices of single-family housing in the 38 cities and towns within King County, Washington. They say that there exists the significant relationship between housing prices and impact fees. The effect of impact fees on new housing is quite significant; that is, the increasing impact fees raises new house prices by about 166 percent of the amount of the fees. The effect of impact fees on the higher-quality homes

is highly significant, but the effect of impact fees on low-quality homes is not statistically significant. This empirical research shows that the effect of impact fees usually relates to new residential developments. Accordingly, the effects of impact fee on housing markets relatively are little empirical research; therefore, the economic incidence of impact fee is not much known for applying developers, new homebuyers, or builders to actually bear the burden of the fees (Ihlanfeldt & Shaughnessy, 2004). Accordingly, impact fee adoption does not coincide in pure public finance motives of equity because impact fees are levied unjustified burdens on new homebuyers for new residential development (California Office of Planning & Research, 1982; Weitz, 1985; Bland, 1989; Levine, 1994).

In fact, local governments do not want developers and builders to transfer development impact fees to new homebuyers, rather developer and builders have to absorb them; however, consumers such as new homebuyers will pay the major share of development impact fees over time (Huffman, Nelson, Smith, & Stegman, 1988). Evans and Lawhon (2003, p. 352) cite that the International City Management Association (ICMA, 1988, p. 5) reported, “Unfortunately there is no respectable empirical analysis to measure how increased fees affect housing prices”. That is, there are few empirical studies for researching the effects of impact fees on the price of housing. There has been little empirical evaluation of how the market responds to impact fees (Huffman, Nelson, Smith, & Stegman, 1988). Also, Simmonds (1993) argues that several studies on who pays impact fees on housing price are still unclear and Been (2005) argues that

the potential effects on the price of housing is little known due to quite a complicated issue.

Huffman et al. (1988) argue that it is an important issue to address the relationship impact fees and housing in local housing market. According to Huffman et al. (1988), even though impact fees are intended by shifting from the sharing burden of property taxes to developers' burden to pay the cost of infrastructure, developers try to transfer their burdens of infrastructure provision to new homebuyers to maximize their development benefits. In this sense, if there are some negative aspects of the use of impact fees with regard to the housing price (Connerly, 1988), the higher price of housing with impact fees reflect the low housing affordability for low and middle income people in the local housing market. That is, it is complicated to determine who actually pays impact fees in the costs of increased infrastructure costs with the competitiveness of housing market for new residential development (Been, 2005; HUD, 2007). In summary, the literature reviewed explores housing and impact fees and provides a number of opinions, arguments, and issues without providing summary conclusions based on national data sets.

CHAPTER 3

THEORETICAL FRAMEWORK OF IMPACT FEES

3.1 Policies and Impact Fees

3.1.1 The Public Choice Theory Perspectives

Public Choice is neoclassical economic theory commonly applied to the public sector. Public Choice theory states that self-interests, rational choices, and individuals' utility-maximizing can be applied as an effective model for public agency decision making (Buchanan & Tullock, 1962; Ostrom, 1975; Scaff & Ingram, 1987; Stretton & Orchard, 1994; Fahy, 1998; Igor, 2003; Frederickson & Smith, 2003; Heine & Mause, 2004). With Buchanan and Tullock, the implications of Public Choice theory for the public sectors could be ignored no longer. Buchanan (2003) refers that the critically important bridge between the behavior of persons who act in the marketplace and the behavior of persons who act in the political process must be analyzed.

Public Choice theory is a highly developed rigorous social science theory with broad applicability to local public policies (Fahy, 1998). Public Choice scholars assume that human beings are self-interested utility maximizers. That is, the most widely used assumption is that human beings seek to maximize self-interest in Public Choice theory. Thus, Public Choice theory can be applied to almost every aspect of individual life, social life, and economic life (Heine & Mause, 2004). The main applications of the idea is that people try to maximize the same things in their political and economic life, so

that political activity can be sufficiently understood and predicted as driven by rational individual self-seeking.

Impact fee adoption relates to local public making decisions for maximizing self-interest as a primary motive. If residents resist higher local taxes such as property tax and federal or state funds for local infrastructure is limited, local governments will be moving toward an alternative source of financing infrastructure. Thus, local governments will need to adopt impact fees as a fiscal policy to finance infrastructure for urban growth (Carrion & Libby, 2004). The adoption process of impact fees is sensitive as a local decision making process because there are many different opinions to decide the share of the cost of local infrastructure in many different actors (Fahy, 1998; Igor, 2003).

The Public Choice theory in adopting impact fees is affected by existing and new residents, interest groups such as builders and developers, and local governments. These local actors attempt to maximize their self-interests through their support or opposition to local impact fee ordinances (North, 1990). According to Blewett and Nelson (1988, p. 285), when Public Choice theory explains the existing residents' behavior with impact fee adoption, they will support new development if they can obtain the free access of new infrastructure and facilities without the burden of the costs for imposing impact fees. On the contrary, if they have to share the burden of costs for new development through higher local taxes, they will resist the new development. For example, the provision of education is a problem because urban growth brings more population. Because public schools are financed by the community at large, new

developments for public schools cause more local burden on the existing residents through the property tax structure. In this sense, the existing residents set up impact fees to maximize their self-interests while allowing new residents into their communities. Impact fees then are imposed to prevent the existing residents from suffering declining welfare since they would not be compensated for the loss of welfare due to the overuse of public infrastructure and facilities with population growth. If the population growth continues to cause insufficient infrastructure and facilities and more rising costs on the existing residents, additional developments for new residents may be opposed by the existing residents regardless of the benefits to society as a whole (Blewett, 1983).

New homebuyers don't actually want to bear the burden of impact fees; however, the imposition of an impact fee in a competitive housing market results in a higher price paid by new homebuyers (Mathur, Waddell, & Blanco, 2004). Singell and Lillydahl (1990) provide empirical evidence that the average price of new houses in Loveland, Colorado, increased by approximately 7 percent between 1983 and 1984. Impact fees increased housing prices by approximately \$3,800. They argue that the price of new houses increased by approximately \$4,500 when Loveland city imposed the cost recovery system on home developers and builders after July 1984. That is, impact fees have a significant effect on the price of new housing.

Ihlanfeldt and Shaughnessy (2004) point out that an additional \$1.00 of impact fees increases the price of new houses by about \$1.60. The increase in new home prices exceeds the total value of the fees since the first impact fee adopted by Dade County was in 1989. In another example, Snyder and Stegman (1986) argued that each \$ 1,000

of impact fee adds \$315 to the annual income a household will need to purchase a home with a 10 percent interest rate on a 30-year mortgage. Although the impact fee increase in required income seems small, it can prevent a substantial number of new homebuyers from purchasing a new home (Connerly, 1988). New homebuyers with moderate-low income probably will have to pay a higher percentage of their income to purchase new houses on which impact fee apply. Delaney and Smith (1989a, 1989b) argue that impact fees give new homebuyers the burden of increased price of both new and existing houses but the increased price is larger on new houses than on existing houses. However, recently, Ihlanfeldt and Shaughnessy (2004) argue that impact fees increase the prices of new and existing homes by the same amount because the difference in the effect of an additional dollar of real impact fees between new and existing housing is very small and statistically insignificant. That is, impact fees increase the price of houses on both new and existing housing. To maximize their self-interests, new homebuyers try to buy existing houses or new houses in the cities without impact fees.

Impact fee adoption is opposed by developers or builders because they cannot maximize their self-interests due to impact fees as a part of development benefits imposed on them. According to Blewett and Nelson (1988), if the benefits of development do not exceed the public service costs, developers or builders will not find it in their development benefits to build. That is, they will oppose impact fees for the low portion of their development profits because if their development profits are not the levels of returns to justify the costs and risk of investing capital, they will stop investments (Huffman, Nelson, Smith, & Stegman, 1988).

Accordingly, developers and builders generally will not bear the reduction of their development profits due to impact fee adoption and they will try to transfer the portion of impact fees on new consumers for maximizing their development profits (Levine, 1994). For example, the National Association of Home Builders (1984) argue that new homebuyers will pay more for new housing because impact fees are designed to impose the burden of new infrastructure costs on new development for new homebuyers. In Public Choice theory, even though local governments want to adopt impact fees to impose the burden of infrastructure, developers and builders will resist the adoption of impact fees, or will try to transfer the burden of impact fees over new homebuyers to maximize their development benefits.

Public Choice theory provides insights about governmental institutions to help explain behaviors that lead to impact fee adoption decision (Jeong, 2004; Jeong & Feiock, 2006). Accordingly, many studies of policy concentrate on local governmental forms (Mooney & Lee, 1995; Berry & Berry, 1999; Jeong, 2004) because the forms of local governments have spurred academic debates about local decision makers' self-interests such as this incentives and motivations about fiscal policies such as revenue options and expenditures for delivering public goods and services (Morgan & England, 1999; Jeong, 2004). Accordingly, this dissertation articulates these forms of local government such as mayor-council and city manager systems that have local authorities to adopt impact fees. Even though a naive view of government is altruistic in contrast to the selfish motives such as private sectors, the Public Choice perspective focuses on local decision makers' behaviors in self-interest in decision making process, regardless

of whether they are local officials such as elected officials or city managers in the two forms of local government (Morgan & England, 1999).

Elected officials try to maximize their probability of reelection to avoid controversial policy decisions and to adopt popular policies (Jeong, 2004). That is, impact fee adoption is a local fiscal policy for imposing additional costs on developers, builders, and new residents for infrastructure; thus, it will allow competitive political forces into government like market institutions in local policy decision making process. According to Frant (1996), the elected officials such as mayors under the mayor-council form of local government grasped of power incentives promoting programs and policies for their reelections. In Public Choice theory, elected officials don't want to make high risks in adopting unpopular programs and policies, because they depend on voters to be reelected. For example, if elected officials are unlikely to adopt increased general property taxes for infrastructure, they will lose the next election and take a lot of criticizing from residents. In a similar vein, if elected officials adopt impact fees that impose a perceived fiscal burden on developers and builders for their infrastructure; thus, they get negative reviews from interest groups such as local home builder associations. Accordingly, it will be difficult to adopt impact fees for elected officials under the mayor-council system in favor of local home builder associations and developers or in favor of existing residents when their self-interests and public interest conflict.

At the turn of the 20th century, the manager-council system emerged to shrink the role of the political machines or mayoral power within local politics (Banovetz,

1994; Morgan & England, 1999). Today a majority of cities with population over 25,000 adopt the manager-council system on a nonpartisan ballot (Morgan & England, 1999). City manager position in the council-manager forms of government has been an important venue for serving the relationship between politics and administration to add professionalism to local decision making (Svara, 1999). The main impetus of manager-council system is city managers' professional management in charge of daily municipal administration. That is, city managers' characteristic is values of professionalism and efficiency enhancement for local government. City managers advise the council on the city's direction, propose policies, and handle implementation for solving fiscal stress to provide infrastructure (Svara, 1999). City managers advise council's members on local financial conditions for maximizing administrative professionalism to adopt impact fees in local policy decision making process (Jeong, 2004).

Home rule charter offers different political motivations or constraints to maximize their self-interests for elected officials and city managers. Home rule authority may provide more self-authority for local decision-makers to determine its own form of government, type of ballot (partisan or nonpartisan), and method of electing council members (ward or at large) (Morgan & England, 1999). That is, home rule authority encourages state legislators to stay out of local affairs for the rights of local self-government (Feiock & Tavares, 2002). Home rule charter pursuits to grant a degree of policymaking power to elected officials and city managers and to achieve general authority to carry out and manage local programs (Jones, 1983). In this sense, home rule charter allows elected officials and city managers greater discretion and

opportunities to adopt impact fees. DeSantis (2003) states that cities having home rule charter could make flexible use of revenue sources compared to non-charter cities. Therefore, elected officials and city managers under the home-rule authority system may have greater discretion to initiate new revenue options.

New and existing residents, interest groups such as builders and developers, local officials may have mostly different views related to the adoption of impact fees for maximizing their self-interests in Public Choice theory. New residents, builders, and developers may oppose the adoption of impact fees based on their perceptions that their property rights and overall city resources do not match their self-interests. On the other hand, the existing residents support for adopting impact fees without the burden of the costs such as higher property taxes for new development. Also, local elected officials attempt to maximize their self-interests through impact fee adoption decision for their reelections. City managers advise the council on the city's financial management to adopt impact fees in local policy decision making process. Also, home rule charter allows elected officials and city managers motivations and constraints to adopt impact fees. Accordingly, Public Choice theory can be applied for the local actors to maximize their self-interests through impact fee adoption. For example, in Eugene, Oregon, impact fee adoptions and levels reflect a community's decision making process with local actors such as local officials, interest groups such as developers and builders, and the public (Deborah, 2003). In summary, Public Choice theory appears to have gained a position on impact fee adoption in the American literature, However, the literature is

still lacking and empirical studies are essential before concluding that adopting impact fees can be best for certain kinds of new development (Bruecker, 1997).

3.1.2 Infrastructure Competition and Adopting Impact Fees

Local infrastructure competition is that local governments race each other through constructing infrastructures such as roads, water supply systems, and other physical public facilities to accommodate urban growth in U.S. MSAs (Taylor, 1991). Advocates of urban growth argue that local governments will be joining in infrastructure competition to attract people in the provision of public goods and services by a given territorial communities (Anas, 1999; Ciscel, 2001). Today, it is important for local governments in U.S. MSAs to provide infrastructure for delivery of public goods and services for residents in efficiency (Pinch & Patterson, 2000; Margulis, 2001). Local infrastructure competition for delivery of public goods and services also increases the consideration of adopting impact fees for financing infrastructure in U.S. MSAs (Taylor, 1991). Accordingly, local infrastructure competition in U.S. MSAs leads local governments to the efficient production and distribution of infrastructure to come up with market solutions (Tiebout, 1956; Ostrom, 1973; Basolo & Hastings, 2003). Local governments should be able to address infrastructure competition for carrying out delivery of public goods and services; that is, its competition promotes efficiency in the provision of public infrastructure and self-determination by territorial communities in U.S. MSAs (Boyne, 1998; Sclar, 2000; Briffault, 2004).

According to the Tiebout, municipal competition can be explained to attract people who seek to better communities for quality of life. Tiebout (1956) argues if

residents want to move from one city to another, they consider local infrastructure for the delivery of public services and goods such as school system, sewer system, water plants, clean environment, and etc. If based on promoting municipal competition to attract people, local infrastructure is an important factor for their movements because people consider the quality of life related to roads, water and sewer, schools and police and fire protection at the expense of the needs of the residents. That is, the needed infrastructure results from municipal competition to attract people by providing a better quality of life for residents (Delaware Valley Regional Planning Commission, 2004).

Margulis (2001) investigates how infrastructure for the delivery of public goods and services such as selective housing traits, local government expenditure, and school district qualities influence household mobility in the suburban four-county Cleveland Metropolitan Statistical Area. Findings show that infrastructure competition is to some extent substantiated in Geauga, Lake, and Medina Counties. That is, government expenditures and amenity-aesthetic improvements in small-size municipalities offer strong enticements for the in-migration of high median-income households. Good infrastructure for the delivery of public services attracts people with increasing with the value of housing. The advantages of the competitive systems of local governments relate to infrastructure competition in U.S. MSAs (Parks & Ronald, 1993). Local governments in U.S. MSAs through more infrastructure competition are formatted for efficiency and responsiveness to deliver public goods and services.

Accordingly, local infrastructure competition in U.S. MSAs brings the increase of impact fee adoption to improve the allocation of government expenditures for

providing infrastructure (Taylor, 1991; Kolo and Dicker, 1993; Pagano, 2002) because local governments intend to rely less on debt financing such as bond issues (Jeong, 2004). Impact fees promote the efficient provision of public infrastructure to match distinctive local financial conditions due to the decline of Federal and State aid and the resistance to any kind of property taxes. Local governments with good fiscal conditions can efficiently provide their public infrastructure for the needs and desires of their taxpayers (Anas, 1999). That is, impact fee adoption can be alternative means for local governments to deliver public goods and services for their taxpayers within the territorial limits in the efficient advantages (Ihlanfeldt & Shaughnessy, 2004). Accordingly, impact fee adoption takes the advantages of the competitive systems of local government in U.S. MSAs (Parks, 1993). Adopting impact fees can be efficient to the competition of local infrastructure for delivery of public goods and services (Blewett & Nelson, 1988, 285)

According to the National League of Cities (NLC, 1987), most public infrastructure projects include high investment costs and long economic life and large operations and maintenance costs. Because infrastructure and public facilities strongly link to economic development, and high capital budgeting, infrastructure is vital to local public policy decisions related to locations and new investment. However, most local governments increasingly fall into difficult situations in financing infrastructure (NLC, 1987). High infrastructure costs are stressful to most local governments that have the largest financial responsibility of providing infrastructure. Accordingly, impact fee adoption will assist local governments the financial burden of infrastructure for new

development (Leithe & Montavon, 1990; Simmonds, 1993) because impact fees will be imposed on developers and builders for infrastructure on a pay-as-you-grow basis (Robinson, 1990). Also, Blewett & Nelson (1988) argue that if impact fees can approach a good financial tool to provide infrastructure for new development, impact fees are an alternative for financing infrastructure. Therefore, infrastructure competition in U.S. metropolitan areas brings local government more impact fee adoption based on the development areas to provide efficient infrastructure in U.S. MSAs (Blewett & Nelson, 1988).

U.S. metropolitan areas are composed of many competitive and overlapping local governments because those areas are highly politically fragmented i.e. Chicago, Houston, Dallas, L.A. areas and etc. These conditions will bring local infrastructure competition for delivering of public goods and services in the metropolitan areas (Warner & Hefetz, 2002). According to Taylor (1991), local governments in U.S. MSAs build roads, sewer system, water supply systems, and other public services not only to accommodate urban growth but also to compete with other local governments for new growth. Thus, local infrastructure competition stimulates local governments to adopt impact fees for financing infrastructure (Taylor, 1991). Accordingly, impact fee adoption in U.S. MSAs increases over time due to population growth and change in cities' preference (Carrion & Libby, 2004). Local infrastructure competition has encouraged local governments to adopt impact fees in U.S. MSAs (Galardi, 2003).

3.2 Legal Consideration of Impact fees

3.2.1 Due Process

Legal issues include the questions on whether impact fees go against constitutional due process of law (Listokin, 1990). Procedural due process is rooted in the Fifth and Fourteenth Amendments (Godschalk, McBeenet, Vestal, & Herr, 1979). According to the Due Process Clause of the Fifth Amendment and the Fourteenth Amendment, no person may be deprived of life, liberty, or property without due process of law. Soules (2002, p. 174) states that “in the federal context, procedural due process rights are violated when the government deprives someone of a protected interest without following the requisite procedures.” That is, due process as procedural rights reserves to substantive individual rights from administrative decision making. Accordingly, procedural due process used in governments’ administrative decision making is fair. In order to levy impact fees on developers and builders, local governments have to follow procedural due process to adopt impact fees under their local ordinances.

In *Durham Landowners et al. v. Durham County* (2006), all builders and developers challenged Durham County school impact fee without enabling legislation from the General Assembly. The trial court mandated Durham County refund plaintiffs their payments with interest. However, Durham County argued that the trial court’s judgment went wrong and the plaintiffs should not have been allowed to maintain a legal action against the County. Therefore, Durham County appealed this Court that the school impact fee possessed the necessary enabling legislation. The Court reviewed the

Durham County authority and reasoning on the both sides. In conclusion, Durham County school impact fee was unlawful, void and without legal effect because the Durham County's school impact fee was imposed without proper enabling legislation from the General Assembly. That is, this case shows that it is important for local governments to follow procedure due process with General Assembly in implementing local policies.

In *James T. James v. County of Kitsap* (2005), the Kitsap County argues that a land use decision relates to procedural requirements of Land Use Petition Act (LUPA) to determine whether the imposition of impact fees as a condition in the Supreme Court of the State of Washington. Developers asked for a reimbursement of impact fees paid to Kitsap County in the trial court before the County's lawsuit. The developers argued that these impact fees were inadequately imposed during the period of the County comprehensive plan with the Growth Management Act, 36. 70A RCW. They challenged the County to refund these impact fees in the trial court. Here, the trial court decided the developers' claims were not subject to the procedural requirements of LUPA and granted a summary judgment motion to buttress the developers. The summary judgment contained an award of \$3,346,506 for the developers. However, the County directly challenged the decision of the trial court, and filed an appeal of the judgment to the Supreme Court because the key subject in this case is whether the imposition of impact fees as a condition on the issuance of a building permit is a 'land use decision' subject to the procedural requirements of LUPA. The County argued developers failed to finish their administrative remedies due to time-barred under LUPA. The Supreme Court

reversed the judgment of the trial court because the developers were barred under LUPA. This case is subject to the procedural requirements of LUPA. That is, it is important for governments and developers to follow procedural due process for ensuring that impact fees are imposed through establishing procedures and criteria not to pay arbitrary fees or duplicative fees.

In *Home Builders Association of Central Arizona v. City of Apache Junction* (2000), the appellants, Home Builders Association of Central Arizona and several corporate home builders, filed this class action to seek injunctive and special action relief to Rules 3(b) and 3(c), Ariz. R. P. Special Actions, 17B A.R.S. The appellants argued that the City of Apache Junction had no authority to enact the Ordinance under § 9-463.05 because article XI, §§ 1 and 2, of the Arizona Constitution basically bared the fee. Therefore, the impact fee imposed was its imposition infringed their due process and equal protection rights under 42 U.S.C. § 1983. However, the judgment of the trial court was that the City had an ability to adopt the Ordinance to impose development impact fee for school capital finance purposes on developers and builders. The plaintiffs challenged the judgment of the trial court related to procedural due process under 42 U.S.C. § 1983 even though the trial court supported the District's motion to intervene in favor of the city. The plaintiffs sought a judgment that the ordinance was unlawful, arbitrary, and in excess of the legal authority of the city under Arizona law. They argued that the city had deprived the class members of due process of law by collecting the fees and sought a return of the fees. Finally, the judgment of the trial court is reversed. The Supreme Court concludes that the city doesn't have the authority to adopt

the ordinance imposing a development impact fee for school capital finance purpose.

According to Soule (2002), in the context of growth management programs, due process claims most commonly pertain to the adequacy of notification with potentially affected persons, as well as limitations on standing for property rights. In general, local governments provide a statement of legislative purposes and adequate criteria to guide their administrative actions that infringe on property rights (Fenster, 2004). In order to impose impact fees on developers and builders, local governments have to follow procedure due process under their local ordinances. Few legal cases related to impact fees have been challenged on the basis of due process because the Fifth and Fourteenth Amendments prevent local governments from taking private property without following the requisite procedures (Soule, 2002).

3.2.2 The Rational Nexus

A central legal issue relates to whether the impact fees can be directly related to new growth or new development (Simmonds, 1993). Bland (1989) says that there are several tests of reasonableness for impact fees, called the “rational nexus” criterion. According to Nicholas and Nelson (1988), the rational nexus criterion requires that: the relationship between the need for new capital facilities generated by the development and the amount of the impact fees must exist proportionally, and there is a reasonable association between the funds collected and the benefits related to the development.

Altshuler and Gómez (1993) present major elements of rational nexus standard: 1) each exaction must be well-designed to meet service needs directly attributable to the project bearing the cost, 2) where facilities are to serve more than a single development,

costs must be allocated in proportion to services rendered, 3) such facilities must be elements of a comprehensive local plan for service improvements 4) where facilities are to be financed by a combination of tax and impact fee revenues, special care must be taken to ensure that project occupants, who pay taxes like everyone else, are not double-billed, and the impact fee calculation, in other words, must be net of anticipated tax contributions, and 5) Impact fee revenues must be segregated until used and must be expended in a timely fashion (generally, within five to six years) for the purpose originally designated.

Clarke and Evans (1999, p. 283) also reports that the legal doctrine of impact fees beyond the “rational nexus” requires a logical link between the impact fees charged and the infrastructure provided for local governments must consider that “(1) each development project is charged an amount that is in proportion to the demand it creates, (2) the facilities financed are part of a comprehensive plan for development, (3) occupants are not double-billed by paying first a fee and then property taxes (the fee must be net of property tax contributions used to finance infrastructure), and (4) the planned facilities are to be built in a timely manner.”

There are several tests of reasonableness known the “rational nexus” in law cases. In *Charleston Trident Home Builders v. Town of Sommerville* (2006), Charleston Trident Home Builders, Non-profit Development Corporation, challenges town's development impact fee ordinance in several respects. To comply with the South Carolina Development Impact Fee Act, "a payment of money imposed as a condition of development approval to pay a proportionate share of the cost of system improvements

needed to serve the people utilizing the improvements." § 6-1-920(8), Town's planning commission prepared an impact fee schedule with Tischler & Associates, Inc. a consulting firm. The impact fee ordinance became effective February 1, 2003. Trident appeals the followings: 1) does the capital improvements plan substantially comply with the Act, and 2) is the fee calculation in the ordinance proper? As a result, Trident couldn't offer analysis of the various factors challenged, and the impact fee calculation is proper in the ordinance.

In *Home Builders of Metro Orlando v. Osceola* (2005), the Home Builders Association of Metro Orlando, Inc. challenged the school impact fee imposed by Osceola County Ordinance. On May 1, 2004, Osceola County amended the existing school impact fee by increasing the amount of the school impact fee from \$2,828 to \$9,708.30 for each single family dwelling unit; from \$1,003 to \$6,346.06 for each multi-family dwelling unit; and from \$1,582 to \$4,657.57 for each mobile home dwelling unit. The Court needs the dual rational nexus test such as need, cost, credits, and facilities for judging the challenge. The rational nexus test was satisfied for the amended school impact fee. Also, the methodology for calculating school impact fee was reasonable and not arbitrary.

Jordan v. Village of Menomonee Falls's case is the first standard for basis and legitimacy in case law. In 1966, the Wisconsin Supreme Court added to the exaction case law with receiving and passing the rational nexus criterion with constitutional validity. That is, this test was applied for determining whether the local government could have substantiated its claim, and the jurisdiction with population growth is

justified in paying the fees for new development or expanding existing facilities (Simmonds, 1993). The dedication or fees in lieu of land for school or recreation purpose, a valid police power, exactions are to be uniquely characteristics to the proposed development in this case. According to Snyder and Stegman (1986, p. 57), the Wisconsin Supreme Court upheld a requirement “for dedication or fee in lieu of dedication, of a school and parks based on the costs of the portion of the facilities that was needed by the new development.”

In *Nollan v. California Coastal Commission* (1987), even though James and Marilyn Nollan leased with an option to purchase a small bungalow on a beachfront lot in Ventura County, California, they needed a development to buy it from the California Coastal Commission. The Commission informed them that the permit would be granted on the condition of allowing for public access to the beach across their property. However, this case show that the Supreme Court applied for the rational nexus in passing on the cost of public facilities to landowners. That is, the required dedication must be related to the impact of the proposed development in the rational nexus. In *Dolan v. City of Tigard* (1994), the Supreme Court qualified the degree of the rational nexus required by *Nollan v. California Coastal Commission*’s case to establish limits on the power of municipalities and other government agencies for implementing regulations to compel property owners to make unrelated public uses. The Court signaled how far local government may go in implementing on municipal power such as building permit condition that the land owner dedicate bike path and greenway/floodplain easements to the city. This case was a landmark related to the

practice of property rights to land-use regulations. In short, *Nollan and Dolan* invented a new standard of case law related to the rational nexus test to determine the degree of municipal power regarding land use regulations and zoning. The Supreme Court's decisions concerning exactions, in-lieu fees and impact fees are found by adopting the rational nexus test.

In *Home Builders Association of Dayton and the Miami Valley v. City of Beavercreek* (2000), Beavercreek city's ordinance adopted an impact fee for financing new roadway projects against the increase in traffic generated by new developments. That is, this case must be investigated that there is a reasonable relationship between the impact fees imposed on developers and the benefits added to the developers from the new roadways. The city ordinance reports that the impact fee funds are to be spent for "capital improvements and expansion of roadways, administrative costs, and expenses related to the impact fee district, and to pay obligations on debt instruments that were issued for the advanced provision of capital improvements", if the funds could have been used for the specific programs with the debt instrument (Section 11(A) through (D), Beavercreek Ordinance, pp. 93-62). The developers challenged the city's ordinance on two issues: "(1) whether the ordinance violates substantive due process and equal protection rights, and (2) whether the ordinance constitutes an illegal taking without just compensation under the United States and Ohio Constitutions". The trial court judged that the ordinance is constitutional on all grounds. However, the Second District Court of Appeals reversed trial court's judgment as the ordinance is constitutionally invalid due to a matching problem to the funds provisions in favor of developers. Appellant,

city of Beavercreek, challenged the decision of the Second District Court to test whether the Beavercreek Ordinance 93-62 is constitutional. The Court used the dual rational nexus test with being based on *Nollan v. California Coastal Commission* (1987) and *Dolan v. City of Tigard* (1994). The dual rational nexus test requires a court to determine two issues: (1) a reasonable connection between additional facilities and the growth of population, and (2) a reasonable connection between the expenditure of impact fees and the benefits to the developed areas. The result of the dual rational nexus test held that the ordinance is constitutional because there is a reasonable connection between the city's interest in constructing new roadways and the increase in traffic generated by new developments. Accordingly, the judgment of the Second District Court of Appeals reversed and trial court's judgment is reinstated as the ordinance is constitutionally valid due to the dual nexus test.

In *Charleston Trident Home Builders v. Town of Sommerville* (2006), the court investigated the impact fee calculation is valid in using "rational nexus test". In *Home Builders of Metro Orlando v. Osceola* (2005), when the Home Builders Association of Metro Orlando, Inc. challenged the amended school impact fee with higher rate, the court judged that the methodology for the higher school impact fee was sensible and not arbitrary in the dual rational nexus test such as need, cost, credits, and facilities. Jordan, Nollan, and Dolan cases are the standard for basis and legitimacy for using "rational nexus test". Those cases were a landmark related to the rational nexus test to determining the degree of local government power regarding impact fees. In *Home Builders Association of Dayton and the Miami Valley v. City of Beavercreek* (2000), the

court also used the rational nexus test to investigate a reasonable relationship between the impact fees imposed on developers and the benefits added to the developers from the new roadways. The ordinance of city of Beavercreek is judged as it is constitutionally valid due to the dual nexus test. The courts' decisions related to the validity of impact fee systems are increasingly based on the rational nexus test. Now, developers, builders, lawyers, planners, and policy makers perceive "the rational nexus test as the main stream approach to setting impact fees" (Stroud, 1988, p. 171).

CHAPTER 4

DATA, HYPOTHESES, METHODS

This chapter develops a statistical, cross-section analysis, to explore the characteristics of cities discussed in the theoretical and practical literature related to the adoption of impact fees in U.S. metropolitan areas. Public agency data are applied to test the hypotheses developed from the literature review. Relationships between local governments (or cities) and impact fee adoption are divided into five distinctions: 1) the forms of local government (forms of municipal government and home rule charter), 2) the geo-demographic characteristics of cities (size of population, rate of growth in population, the birth year of city, and regions), 3) housing (ratio of single family dwelling unit permits divided by the total dwelling unit permits, rate of growth in homeownership rate, rate of growth in median value of owner-occupied housing units), 4) local financial conditions (ratio of road park water and sewer expenditure divided by total revenue, and per capita debt expenditure), and 5) local economic conditions (rate of growth in median household income, rate of growth in the number of employment divided by rate of growth in housing unit, and unemployment rate) in U.S metropolitan areas. Binary logistic analysis is employed as a preferred statistical routine to analyze the variables composing the factor of impact fee adoption. Findings based on the above five areas will be developed from examining a random sample of cities within their regions across the U.S. Metropolitan Statistical Areas.

4.1 Sampling and Variables

4.1.1 Data Sampling

U.S. Census Bureau (2000) provides four regions; Northeast, Midwest, South, and West and 2000 population data. The metropolitan regional setting of cities is important to analyze the overall growth pattern of U.S. population and compare the sampled local governments in the different regions.

According to Federal Register Notice (OMB, 2000), Metropolitan Statistical Area (MSA) is "a core based statistical area associated with at least one urbanized area that has a population of at least 50,000, plus adjacent outlying counties having a high degree of social and economic integration with the central county as measured through commuting." U.S. Census Bureau reports that there are total 361 MSAs in 2006 State and Metropolitan Area Data Book. Accordingly, this dissertation randomly collects 278 local governments out of 827 local governments with exceeding 25,000 on 97 MSAs with exceeding 500,000 out of the total 361 MSAs in the four regions of the United States.

Frey (2005) mentions that there is a further distinction between large metropolitan areas with 2000 populations exceeding 500,000, and the remaining small metropolitan areas for the 2000 U.S census data. Based on this distinction, the research targeted areas are the 97 Metropolitan Statistical Areas with exceeding 500,000 populations because the remaining Metropolitan Statistical Areas include a few local governments and the 97 Metropolitan Statistical Areas are also scattered across the United States. First, the targeted 97 Metropolitan Statistical Areas with exceeding

500,000 are chosen from the 361 U.S. Metropolitan Statistical Areas. Second, 278 local governments out of 827 local governments with exceeding 25,000 are randomly selected using a table of random numbers from the 97 metropolitan local governments. Clarke and Evans (1999) argue that even though local policies, such as spending and the issue of bonds, occur over a number of years, any certain time period improves the probability of being representative of a city's policies and avoids the methodological pitfalls of a pooled time series. Thus, the sampling for the analysis is local agencies' data between 1990 and 2000, and the data between 2001 and 2002 for local financial data in this dissertation.

4.1.2 Dependant Variable

The dependant variable for this analysis is "impact fee adoption" in local governments. It is a dichotomous variable that is measured with a value of one if local government adopted at least one impact fee and a value of zero if it has not. Note that an impact fee is considered to be any kind of infrastructure fee; for example, including capacity fees, facility fees, system development charges, capital recovery fees, Fees-in-Lieu of dedication, development taxes, and availability fees. This dichotomous variable will be able to determine whether local government has impact fees or not. To support the importance of this yes/no variable of adopting impact fees as public policy, a brief discussion is warranted here to restate findings from literature review in Chapter 2 and 3.

Local governments have changed their funding sources and revenue structures as they adopted impact fees to finance of their infrastructure and facilities over the past 20-30 years (Mathur, Waddel, & Blanco, 2004). About 59 percent of cities with more

than 25,000 residents impose impact fees to control cities' growth and fund their infrastructure (GAO's Survey, 2000). In a study, Clarke and Evans (1999) found that there are impact fees for various types of infrastructure such as street, water, and sewer to recover their cities' costs. Local governments adopt impact fees to recover costs for infrastructure, public facilities, and capital improvements. Commonly, local governments have used impact fees for the following public facilities: a) water treatment and distribution, b) wastewater treatment and disposal, c) sanitary sewers, d) storm water, drainage, and flood control, e) public road systems and rights of ways, f) public parks, public open space, and recreation, g) police, emergency medical, rescue, and fire protection, and h) solid waste collection, transfer, processing, and disposal (Bachrach, Juergensmeyer, Nelson, Nicholas, Ramis, & Strauss, 1988). According to Leithe and Montavon (1990), three types of impact fees such as sewer/water, transportation, and parks are commonly adopted by local governments.

Even though there are various types of impact fees depending on local governments, this empirical study of "impact fee adoption" will examine local government impact fee types such as roads, water, sewer, schools, parks, police, fire protection, and etc. Local governments' impact fee adoption will be related to the independent variables of 1) forms of local government, 2) geo-demographic characteristics of cities, 3) housing, 4) local financial conditions and 5) local economic conditions.

4.1.3 Independent Variables

4.1.3.1 Forms of local government

The major unit of local government is a municipality such as city, town, or village. The forms of local government are referenced by specifying two forms: mayor-council and city manager systems in policy studies (Jeong, 2004). The city manager system consists of council-manager form that centers the executive power in the hands of a full-time professionally trained city manager hired by the council to run day-to-day city operation and the council is responsible for making policy, passing ordinances, voting appropriation, and supervising in an overall administration of government (Morgan & England, 1999; Petterson, 2006). The mayor-council form of government has a basic separation of powers between the legislative and executive branches. However, the mayor as the chief executive officer has the widespread power of administration as the chief executive as cities grow and government becomes increasingly complex (Jones, 1983; Morgan & England, 1999; Petterson, 2006, p. 598). The mayor-council system consists of a “weak” or “strong” mayor form of government. A weak mayor form of government depends on negotiating decisions with city council persons to form coalition votes. A strong mayor form of government grants mayors more powers than a weak mayor form of government on appointing and terminating city managers or department heads of city; however, council having the power to reject mayors’ decisions. This dissertation uses a mayor-council system as an independent variable for both weak and strong mayor form of governments because few cities reflect the extremes of differences between the weak-mayor and the strong-mayor forms

(Morgan & England, 1999; Petterson, 2006). Accordingly, this dissertation articulates these forms of local government in order to examine impact fee adoption. The two forms of municipalities, mayor-council and city manager systems, are legal entities that have local authorities to operate under a chapter or an ordinance enabled by the state (Petterson, 2006). The two forms of municipal government can have an impact on adopting impact fees.

Home rule charter adoption brings significant impacts on local decision making for local financial policies because home rule charter allows local governments to give more leeway in local policies (Morgan & England, 1999). Under Dillon's Rule, which describe relationship between state and local governments; local governments are creatures of the states, local governments must act within constraint by the state; that is, they can provide limited services such as welfare, transportation, health, and judicial services in state statutes. However, home rule charter under Cooley's rule which advocated that cities govern themselves, allows local governments to design and amend its own charter; that is, it seeks to free local governments' authorities from regulation and interference by the states (Jones, 1983; Morgan & England, 1999; Patterson, 2006). Home rule charter permits local policy makers such as commissioners, mayors, and city managers, more options and chances to set off new revenue or financial plans such as impact fee adoption as long as those plans are not in violation of the state statutes (Jeong, 2004).

4.1.3.2 Geo-demographic Characteristics of Cities

U.S. Census Bureau for the 1990s reports that 80.3 percent of the U.S. population lived in metropolitan areas. Also, Perry and Mackun (2001) disclose that the population change rate within metropolitan areas grew by 14 percent. U.S. Census Bureau provides the four broad statistical regions¹ such as NORTHEAST, MIDWEST, SOUTH, and WEST in the United States under the trend of population for the 1990s. U.S. Census Bureau (2000) reports percentage change in metropolitan populations by the Four Regions. The West and South regions with an overall 20 percent growth rate grew more rapidly than the Midwest and the Northeast regions with below 9 percent for the 1990s; therefore, the regional setting is important to analyze the overall growth pattern of U.S. population.



Figure 4.1 Census Regions of United States, U.S. Census Bureau 2000

¹ 1) NORTHEAST: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont, New Jersey, New York, Pennsylvania. 2) MIDWEST: Indiana, Illinois, Michigan, Ohio, Wisconsin, Iowa, Nebraska, Kansas, North Dakota, Minnesota, South Dakota, Missouri, 3) SOUTH: Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia, Alabama, Kentucky, Mississippi, Tennessee, Arkansas, Louisiana, Oklahoma, Texas, 4) WEST: Arizona, Colorado, Idaho, New Mexico, Montana, Utah, Nevada, Wyoming, Alaska, California, Hawaii, Oregon, Washington.

Petersen (1990) mentions that urban growth such as the growth of population provides a variety of challenges to local governments. He argues that the important one of the challenges is how to provide infrastructure to meet urban growth such as the growth of population. That is, the geo-demographic characteristics of cities such as pressures of population growth on the limited revenue-raising capabilities of local government have stimulated alternative means of financing infrastructure. Burchell, Downs, McCann, and Mukherji (2005, p. 95) state that the causes of infrastructure problems such as traffic congestion and the lack of school facilities in U.S. MSAs are related to the growth of population. Frank and Rhodes (1987) mention that cities' growth such as population growth can be associated with the adoption of impact fees. Higher or fast growth cities are more likely to adopt higher impact fees than lower growth cities.

According to Gilliland, Krebs, and Vanderberg (1992), larger cities are more likely than smaller ones to adopt impact fees. They report that only 5 percent of smaller population cities surveyed had adopted impact fees versus 37 percent of large cities. The size of population as a geo-demographic characteristic of a city is important to understanding the overall growth pattern of cities related to impact fee adoption in U.S. MSAs.

Barnett (1995) provides a synopsis of dynamics that explain the fragmentation of U.S. metropolitan areas related to the disparity between old and new cities. Fulton et al. (2001, p. 3) report that U.S. metropolitan areas consume land faster than the population growth; thus, sprawl is occurring in advance of population of the

metropolitan areas. Population migration outward from the inner city is a given feature of urban development in the U.S. metropolitan areas. People migrate to the suburban areas of U.S. metropolitan areas to seek better lives (Burchell et al. 2005; Levy, 2006). Barnett (1995) argues the sprawls in U.S. MSAs are developing new cities that face lack infrastructure due to the rapid growth of population; also, old cities need the revitalization of infrastructure. That is, the migration leads to urban sprawl that pushes residents to young cities in the U.S. metropolitan areas. In this sense, the birth year of cities between old cities and young cities in U.S. MSAs will be related to the adoption of impact fees.

4.1.3.3 Housing

Local governments must find alternative sources of revenue (such as user fees and impact fees) to fund their rising infrastructure costs for new residential development in the U.S. metropolitan areas (Dresch & Sheffrin, 1997). New residential developments are associated with the number of development permits issued (Evans, 2000; Jeong, 2004). There are two categories of residential building permits such as single family housing and multi-family housing permits. Each local government issues a different number of housing permits depended on their cities' situations such as urban growth rate, local financial conditions, etc. Accordingly, cities with big population will issue the more number of residential building permits than cities with small population do. That is, it will be not meaningful to compare the number of residential building permits according to the different sizes of cities. In order to avoid the statistical errors, this

dissertation uses the mean ratio of single family dwelling unit permits divided by the total dwelling unit permits for new residential developments between 1996 and 2000.

Been (2005) argues that increasing impact fees will limit on the affordability of housing. There is a relationship between impact fees and housing prices related to the housing affordability and the number of housing units (Been, 2005; HUD, 2007) However, comparing the price of housing for different regional settings is difficult due to variations in the prices of same types and size of housing in different regional settings. In order to avoid any statistical errors, this dissertation investigates the relationship between impact fee adoption and the growth of home ownership rate and the growth of the number of housing units as a housing characteristic on individual city in the different regional settings. The relationship between rate of growth in median value of owned-occupied housing units between 1990 and 2000 as a municipal housing characteristic and impact fee adoption will be examined. Also, the relationship between rate of growth in housing units between 1990 and 2000 and impact fee adoption will be examined.

4.1.3.4 Local Financial Conditions

According to Pagano (2002), urban growth of the past decade has affected most local governments to increase spending on both general revenues and capital facilities. That is, the average annual growth of local governments' general fund expenditure was 1.99 percent between 1993 and 2000, whereas the average growth rate for capital spending was 7.8 percent per year during the same period. Thus, local governments are compelled to consider the potential growth of infrastructure costs for new developments.

Also, Carrion and Libby (2004) argue that local governments have continual problems with financing infrastructure (i.e. roads, bridges, sewage treatment plants) to support new development because local governments had depended on federal and state funds as grants and supplements. That is, the relationship between Ratio of road- park-water-and-sewer expenditure divided by total revenue and the adoption of impact fees will be important for alternative local financing mechanism for local infrastructure. The Ratio of road- park-water-and-sewer expenditure divided by total revenue between 2001 and 2002 is a financial characteristic on each city. Thus, it will be anticipated that cities with the higher Ratio of Road Park Water and Sewer expenditure divided by total revenue between 2001 and 2002 will be more likely to adopt impact fees than cities with the lower Ratio of Road Park Water and Sewer expenditure divided by total revenue between 2001 and 2002.

According to Jeong (2004), local financial conditions are measured by per capita debt expenditure. Local governments will use debt service funds to accumulate the resources to make principal and interest payments on existing bond issues. The debt service funds are usually used to set aside capital improvement funds for public facilities and infrastructure. Per capita debt expenditure means the debt burden by residents. Per capita debt expenditure is the total debt service funds divided by cities' population. The mean per capita debt expenditure between 2001 and 2002 is a financial characteristic on each city.

4.1.3.5 Local Economic Conditions

Infrastructure creates additional investment or economic growth with private firms or public agencies (National League of Cities, 1987). NLC says that residents of inadequate infrastructure endure significant costs such as user's time and money. That is, worsening of public infrastructure and deficient capacity to be big enough for future growth will restrain local economic development. Also, improved public infrastructure with impact fees may benefit local economy by reducing the uncertainty and risk of development permit and approval (Altshuler & Gomez-Ibanez, 1993; Nelson & Moody, 2003). Impact fee adoption is resulting from urban growth in support of additional population, employment, local economic development in a community (Delaware Valley Regional Planning Commission, 2004). Impact fees are seen to induce jobs growth in local economic conditions (Dresch & Sheffrin, 1997). Moody and Nelson argue that the goals of economic growth are to create jobs; Accordingly, Blair (1995) argues that job growth relates to rate of growth in employment in local economic conditions. Also, the unemployment rate is an important factor to evaluate local economic conditions.

Median household income is an important economic and social variable to better comprehend who will move into the new housing supported by the impact fees because median household income is accepted as a local economic index to explain standard life values for individual economic conditions (Hausrath, 1988). However, it is difficult to apply median household income for individual economic condition comparison because median household income with the same types of occupation also varies over different

MSAs. This dissertation uses the rate of growth in median household income between 1990 and 2000 because the rate of growth in median household income depends on cities' own economic characteristics. Employment growth rate, unemployment rate and the rate of growth in median household income as independent variables can explain on local economic conditions (Nelson, Drummond, & Sawicki, 1995). Rate of growth in employment, the mean unemployment rate between 1990 and 2000 and the rate of growth in median household income between 1990 and 2000, will be considered in this dissertation and can be interpreted as a "local economic index" to explain the relationship between the adoption of impact fee and local economic conditions.

Table 4.1 Variables and Data Sources

Variables	Data Sources
<i>Dependent variable</i>	
Impact Fee Adoption Adoption of impact fees (adoption: 1; non-adoption: 0)	City Information
<i>Independent Variables</i>	
Forms of Local Government ▪ Forms of municipal government ▪ Home rule charter	City Codes Information
Geo-demographic characteristics of Cities ▪ Rate of growth in population (1990-2000) ▪ The size of population ▪ The birth year of city ▪ Regions (West and South, or Midwest and Northeast)	U.S. Census Bureau
Housing ▪ Mean ratio of single family dwelling unit permits divided by the total dwelling unit permits (1996-2005) ▪ Growth in homeownership rate (1990-2000) ▪ Rate of growth in median value of owner-occupied housing units (1990-2000)	U.S. Census Bureau

Table 4.1 – *Continued*

Local Financial Conditions <ul style="list-style-type: none"> ▪ Per capita debt expenditure (2001-2002) ▪ Ratio of Road Park Water and Sewer expenditure divided by total revenue (2001-2002) 	Local governments' budget books U.S. Census Bureau
Local Economic Conditions <ul style="list-style-type: none"> ▪ Rate of growth in median household income (1990-2000) ▪ Rate of growth in the number of employment divided by rate of growth in housing unit (1990-2000) ▪ Mean unemployment rate (1990-2000) 	U.S. Census Bureau

4.2 Hypotheses

Primary-Major Hypothesis: There are relationships between impact fee adoption and the overall characters of cities with regard to Forms of Local Government, Geo-Demographic Characteristics of Cities, Housing, Local Financial Conditions, and Local Economic Conditions.

4.2.1 Forms of local government

Hypothesis 1

Local governments with Manager-Home Rule Charter are more likely to have impact fees than local governments with the others.

Hypothesis 2

Local governments with Manager-Non Home Rule Charter are more likely to have impact fees than local governments with the others.

Hypothesis 3

Local governments with Mayor-Home Rule Charter are more likely to have impact fees than local governments with the others.

The forms of local government at the municipal level have been represented by the two forms of municipalities such as mayor-council and council-manager forms in

order to examine impact fee adoption as a local fiscal policy (Jones, 1982; Morgan & England, 1999). Also, home rule charter can allow local government to redefine the judicial, legislative, and administrative power not in violation of the state statutes (Benton, 2002). Accordingly, the forms of local governments are divided into four category variables using two-by-two matrix such as 1) manager-home rule charter, 2) manager-non home rule charter, 3) mayor-home rule charter, and 4) mayor-non home rule charter. Each category variable is encoded using dummy values.

4.2.2 Geo-demographic characteristics of Cities

Hypothesis 4

Cities with larger populations divided by 1000 for 2000 are more likely to have impact fees.

Sub-Hypothesis 4-1

Cities with populations between 25,000 and 50,000 for 2000 are more likely to have impact fees than other cities for 2000.

Sub-Hypothesis 4-2

Cities with populations between 50,000 and 100,000 for 2000 are more likely to have impact fees than other cities for 2000.

Sub-Hypothesis 4-3

Cities with populations between 100,000 and 250,000 for 2000 are more likely to have impact fees than the other cities for 2000.

Frank and Downing (1987) found demographic characteristics of community that are useful to consider for adopting impact fees in U.S. MSAs; that is, large population communities need to adopt impact fees to support comprehensive plan

implementation and to manage growth in developing communities as well as in older revitalizing communities. According to Gilliland, Krebs, & Vanderberg (1992), larger cities are more likely to adopt impact fees than smaller ones in a survey of Texas cities. Only 5% of the smaller cities in the survey had adopted impact fees, whereas 37% of larger cities had adopted impact fees because larger cities had to provide more infrastructure such as water and sewer connections. Also, Evans (2000), reports that 40 percent of the 25 largest cities in Texas have adopted impact fees. For using the size of population, Clarke and Evans (1999) categorize the size of population ranges from less than 50,000, between 50,000 and 100,000, and between 100,000 and 250,000 to over 250,000 because the stratified sample may help improve external validity. Local governments will spend more millions of dollars to build infrastructures such as new roads, sewer, and schools due to the size of to population from their study. The size of cities is divided into four category variables such as 1) 25,000-50,000, 2) 50,000-100,000, 3) 100,000-250,000, and 4) over 250,000. Each size of population variable is encoded using dummy values for Model II.

Hypothesis 5

Cities with higher rates of growth in population between 1990 and 2000 are more likely to have impact fees than cities with lower rates of growth in population between 1990 and 2000.

Burchell, Downs, McCann, and Mukherji (2005) state that urban sprawl as a reason expanding and building new infrastructure due to the rapid growth of suburban population at 12.5 percent, whereas most central cities are not able to keep pace with small increase of only 3.9 percent. They argue that 1980s to 2000s data indicates that

the suburban areas of U.S metropolitan areas rapidly urbanized undergo infrastructure problems such as the heavy traffic congestion, need for schools and improved water systems due to rapid population growth. That is, a higher rate of growth in population requires expanding infrastructure such as new roads, water and sewer systems, and schools. Frank and Rhodes (1987) mention that city population growth relates to the adoption of impact fees. According to Blewett and Nelson (1988), one of the most significant demographic characteristics of a city is population growth. Conceptually, change in population in a city should intensify or alleviate many of the urban growth oriented problems. As a result, the search for a relationship between population growth and the adoption of impact fees is of particular interest, for it may lead to the possibility of predicting future densities and their impacts with the adoption of impact fees. That is, cities with higher rate of growth in population between 1990 and 2000 are more likely to adopt impact fees than cities with lower rate of growth in population between 1990 and 2000.

Hypothesis 6

Young cities are more likely to have impact fees than old cities.

The birth year of cities will be associated with the adoption of impact fees. Barnett (1995) provides a clear proposal for improving young cities and restoring old cities in U.S. MSAs. She mentions that young cities are usually rapid growth cities related to suburban centers and sprawl in U.S. MSAs. The young cities require expensive infrastructure such as roads, sewers, water plants, etc. to meet the need of new residents for new development. However, old cities need revitalized or improved

infrastructure, for both new residents and existing residents. That is, the old cities have different conditions because new cities have more new development. Accordingly, new development will need capital costs for infrastructure in young cities. Young cities will be more likely to adopt impact fees than old cities for new development.

Hypothesis 7

Cities in West and South regions are more likely to have impact fees than Cities in Midwest and Northeast regions.

U.S. Census Bureau reports percentage change in metropolitan populations by four regions: NORTHEAST, MIDWEST, SOUTH, and WEST. U.S. Census Bureau (2000), report that the West and South regions with an overall 20 percent growth rate, grew more rapidly than the Midwest and the Northeast regions from 1990 to 2000. The West swelled 19.6 percent and the South gained 19.3 percent, while the Midwest grew 8.7 percent and the Northeast gained 5.6 percent in metropolitan percentage change (U.S. Census Bureau, 2000). Due to regional trends in population, metropolitan local governments of West and South regions are inevitably facing with more urban growth problems than the metropolitan area local governments of the Midwest and the Northeast in financing public facilities and infrastructure (Pack, 2005). The adoption of impact fees will strongly be related to the geo-demographic characteristics of cities such as regional place of city. That is, cities in West and South regions are likely to have impact fees than cities in Midwest and Northeast regions.

4.2.3 Housing

Hypothesis 8

Cities with the higher mean ratios of single family dwelling unit permits between 1996 and 2000 divided by the total dwelling unit permits during that time will be more likely to have impact fees than cities with lower mean ratios of single family dwelling unit permits.

Local residential developments are controlled by housing permits. Even though there are several types of development permits such as residential, commercial, and industrial permits, this study only focuses on residential development permits in investigating the relationship between housing and impact fee adoption (Jeong, 2004). Two types of residential permits consist of single- and multi-family housing permits. However, the application of impact fees for the two types is different because single-family housing impact fees are much higher than multi-family housing impact fees. For example, in the *Home Builders of Metro Orlando v. Osceola* (2005), on May 1, 2004, Osceola County amended the existing school impact fee by increasing the amount of the school impact fee from \$2,828 to \$9,708.30 for a single-family housing, and from \$1,003 to \$6,346.06 for a multi-family housing. That is, single family dwelling units require higher amount of more impact fees than multi family dwelling units for infrastructure. Thus, cities with the higher ratios of single family housing permits to the total housing permits should be likely to adopt impact fees. Cities with the higher mean ratios of single family dwelling unit permits between 1996 and 2000 divided by the total dwelling unit permits during the time will be more likely having impact fees than cities

with the lower mean ratio of single family dwelling unit permits between 1996 and 2000 divided by the total dwelling unit permits during the time.

Hypothesis 9

Cities with a higher growth rate in home ownership between 1990 and 2000 will be more likely to adopt impact fees than cities with the lower growth rate in home ownership between 1990 and 2000.

Impact fees are more efficient and more equitable than alternative financing mechanisms for new residential development (Ihlanfeldt & Shaughnessy, 2004, p. 640). However, Huffman et al. (1988) argue that there are some negative aspects of the use of impact fees on the housing affordability, because developers or builders transfer their burdens of infrastructure provision to new homebuyers to pay the costs (Connerly, 1988; Huffman et al., 1988). According to Been (2004), impact fee adoption can exclude low-and moderate-income residents because impact fees can make the higher prices of housing for new residential development. Also, HUD (2007) mentions that low and moderate income homebuyers cannot afford high impact fees and there is no substitute choice of housing. Impact fees on housing affordability is hotly debated (HUD, 2007); accordingly, impact fee adoption will be relating to local home ownership rate. Cities with a higher change in the home ownership rate between 1990 and 2000 will be more likely to adopt impact fees than cities with a lower change in home ownership rate between 1990 and 2000.

Hypothesis 10

Cities with the higher rate of growth in median value of owned-occupied housing units between 1990 and 2000 will be more likely having impact fees than cities with

the lower rate of growth in median value of owned-occupied housing units between 1990 and 2000.

One empirical study provided results from estimating impact fees on the prices of new and existing single-family house for Dade County, Florida (Ihlandfeldt, 2002). The adoption of impact fees affected increases in both new and existing housing prices. However, even though there are some studies, the empirical research on the relationships between impact fees and residential development are comparatively thin (Burge & Ihlanfeldt, 2006). The International City Management Association points out that there is no empirical analysis to measure the relationship impact fees and housing prices (ICMA 1988, p. 5). Also, Evans and Lawhon (2003) mention that there are limited empirical studies that address the effects of impact fees on housing prices. That is, housing price comparison with impact fee adoption over different MSAs is also not meaningful because housing prices with the same types of housing vary over different places such as California, New York, Arizona, Texas, and so on. Accordingly, this dissertation uses the rate of growth in median value of owned-occupied housing units between 1990 and 2000 to compare in the different regional settings. The rate of growth in median value of owned-occupied housing units between 1990 and 2000 is a housing characteristic on each city. That is, it will be anticipated that cities with the higher rate of growth in median value of owned-occupied housing units will be likely to adopt impact fees. Cities with the higher rate of growth in median value of owned-occupied housing units between 1990 and 2000 will be more likely having impact fees than cities

with the lower rate of growth in median value of owned-occupied housing units between 1990 and 2000.

4.2.4 Local Financial Conditions

Hypothesis 11

Cities with the higher ratio of Road Park Water and Sewer expenditure divided by total revenue between 2001 and 2002 are more likely to have impact fees than cities with the lower ratio of Road Park Water and Sewer expenditure divided by total revenue between 2001 and 2002.

As cities grow, local governments must develop alternative financial tools to meet the increased infrastructure costs due to the decline of Federal and State aid and the resistance to any kind of property taxes. However, urban growth has stressed local governments to meet spending on infrastructure costs. According to Pagano (2002), even though the both general and capital facilities expenditures have increased for the recent decade, the average growth rate for capital improvement expenditure is higher than the average annual growth rate of local governments' general fund expenditure. That is, local governments have to deliberate the potential reduction of general revenues for infrastructure costs. Accordingly, the ratio of Road Park Water and Sewer expenditure divided by total revenue as a financial characteristic on each city is an independent variable to explain the local financial conditions. Thus, it will be anticipated that cities with the higher ratio of Road Park Water and Sewer expenditure divided by total revenue between 2001 and 2002 are more likely to have impact fees than cities with the lower ratio of Road Park Water and Sewer expenditure divided by total revenue between 2001 and 2002.

Hypothesis 12

Cities with higher mean per capita debt expenditure between 2001 and 2002 are more likely to have impact fees than cities with lower mean per capita debt expenditure between 2001 and 2002.

Evans (2000) tested that total revenue was compared between impact fee and non-impact fee cities in local financial conditions. As the result, all cities with impact fees increase revenues. Thus, impact fees can be an alternative revenue source; also, the adoption of impact fees can be offset by some cities' reduced property taxes in local financial conditions. That is, impact fee adoption will see an increase in total cities' revenues. Jeong (2004) argues that local financial conditions can be measured by per capital debt expenditures to explain the debt burden by the citizens. Accordingly, it will be anticipated that cities with the higher mean per capita debt expenditure on debt service funds between 2001 and 2002 will be more likely to adopt impact fees than cities with lower mean per capita debt expenditure on debt service funds between 2001 and 2002.

4.2.5 Local Economic Conditions

Hypothesis 13

Cities with higher rate of growth in median household income between 1990 and 2000 are more likely to have impact fees than cities with lower rate of growth in median household income between 1990 and 2000.

Hypothesis 14

Cities with higher rate of growth in the number of employment between 1990 and 2000 are more likely to have impact fees than cities with lower rate of growth in the number of employment between 1990 and 2000

Hypothesis 15

Cities with lower mean unemployment rates between 1990 and 2000 are more likely to have impact fees than cities with higher unemployment rates between 1990 and 2000.

Dresch and Sheffrin (1997) mention that impact fees help sustain jobs growth in local economic conditions. One of the primary goals of economic development is to create jobs (Moody & Nelson, 2003). Blair (1995) argues that job creation addresses the rate of growth in the number of employment to explain local economic condition. Cities with job growth attract the unemployed who move into the labor markets where these are new jobs. Cities with higher rates of growth in employment between 1990 and 2000 should be more likely to adopt impact fees than cities with lower rates of growth in employment between 1990 and 2000.

Also, the unemployment rate will explain local economic conditions. Unemployment rate is defined herein as change in enhancing local economic conditions (Blair, 1995). That is, the relationship between unemployment rate and the adoption of impact fees will be a factor to understand local economic conditions. Accordingly, local economic conditions will be reflected by relationships between the mean unemployment rate between 1990 and 2000 and the adoption of impact fee. It will be anticipated that cities with lower mean unemployment rates between 1990 and 2000 will be more likely to adopt impact fees than cities with higher mean unemployment rates between 1990 and 2000.

Median household income is also defined herein as change in local economic conditions (Blair, 1995). Local economic growth coupled with rising household

incomes in cities (Blair, 1995; Jacobs, 2006). Higher income households are able to secure their preferred housing by moving into new dwelling units (Hanseth, 1988). This dissertation uses, not median household income, but the rate of growth in median household income as a local economic characteristic for recognizing local economic changes. That is, local economic conditions will relate to household income growth. Accordingly, it will be anticipated that cities with the higher rate of growth in median household income between 1990 and 2000 will be more likely to adopt impact fees than cities with lower rate of growth in median household income between 1990 and 2000.

4.3 Statistical Methods

This study of the relationships between impact fee adoption and overall city characteristics is examined using cross-sectional data (CSD). According to Wooldridge (2000, p. 6), cross-section-data are widely used in both economics and the other social sciences, and this data set consists of a sample of individuals, households, firms, cities, states, countries, or a variety of other units at a given time. CSD is functional records to analyze micro-economics fields such as labor economics, state and local public finance, industrial organization, urban economics, demography. For example, Garrett (1998) investigates government economic policy and performance in 14 OECD nations at a given in time. He examines whether labor organization and political partisanship affect economic policies over time. That is, CSD is characterized by a series of fixed units such as countries, states and cities. In this dissertation, a cross section data set on forms of local government, geo-demographic characteristics of cities, housing, local finance conditions, and local economic conditions at a given in time are important for testing

hypotheses and evaluating impact fee adoption in a number of local governments of the U.S metropolitan areas.

According to Horowitz and Savin (2001, p. 43), a binary response model is useful for making a choice between two alternatives in many economic applications; for example, people can choose to drive a car or take public transit. Another example is the policy choice of a local government between impact fee adoption or not. This cross section data can be analyzed by extending the logistic model with a binary dependent variable in this dissertation. This empirical study for determining local government's impact fee adoption is a logistic regression with binary response.

The binary logistic regression directly estimates the probability of an event occurring because there are only two responses for dependant variable such as impact fee adoption or not. In a logistic regression, the formula below is as follow:

$$\ln(P/1-P) = b_0 + b_1X_1 + b_2X_2 \dots\dots\dots + b_nX_n$$

b_0 and b_p are the estimated regression coefficient. For several predictors ($X_1, \dots\dots X_n$), the probability of an event can be written as

$$P = 1/1+e^{-(b + b_1X_1 + b_2X_2 \dots\dots\dots + b_nX_n)}$$

or

$$P = 1/1+e^{-Z}$$

e is the base of the natural logarithms and Z is the linear combination as follow:

$$Z = b_0 + b_1X_1 + b_2X_2 + \dots + b_nX_n$$

The probability of the event occurring is as follow:

$$\text{Probability (no event)} = 1 - \text{Probability (event)}$$

The cross section data can be analyzed by the binary logistic regression with a dependant variable that is binary rather than continuous. A linear combination (Z) is an equation related to the relationship between impact fee adoption and independent variables in a binary logistic regression. Thus, the binary logistic regression is applied to the relationship between impact fee adoption and these independent variables with five sections such as forms of local government, geo-demographic characteristics of cities, housing, local financial conditions and local economic conditions through 278 cities in the 97 U.S metropolitans. The equation follows:

$$\begin{aligned} \text{Logit (ImpactFeesAdoption)} = & b_0 + \\ & b_1\text{FormsOfLocalGovernment(ManagerHomeRuleCharter)} + \\ & b_2\text{FormsOfLocalGovernment(ManagerNonHomeRuleCharter)} + \\ & b_3\text{FormsOfLocalGovernment(MayorHomeRuleCharter)} + \\ & b_4\text{SizeOfPopulationdividedby 1000} + b_5\text{RateofGrowthInPopulation} + b_6\text{AgeofCity} \\ & + b_7\text{Regions(West and South or Midwest and Northeast)} + \\ & b_8\text{MeanRatioofSingleFamilyDwellingUnitPermitsDividedbytheTotalDwellingUnit} \\ & \text{Permits} + b_9\text{ChangeInHomeownershipRate} + b_{10}\text{RateOfMedianValueOfOwner-} \\ & \text{OccupiedHousingUnits} + b_{11}\text{MeanPerCapitaDebtExpenditure} + b_{12}\text{Ratioof} \\ & \text{Road-Park-WaterandSewer-ExpendituredividedbyTotalRevenue} + \\ & b_{13}\text{RateOfGrowthInMedianHouseholdIncome} + b_{14} \end{aligned}$$

RateofGrowthintheNumberofEmploymentdividedbyRateofGrowthinHousingUnit

+ b15MeanUnemploymentRate, Where, b0: constant

CHAPTER 5

FINDINGS AND ANALYSES

5.1 Impact Fee Adoptions for 278 Local Governments

This research examined the statistical relationships between adopting impact fees and overall characteristics of cities for 827 local governments. There are a sub total of 827 cities having populations over 25,000 within the total number of 8,127 cities located within 97 Metropolitan Statistical Areas having populations exceeding 500,000. The research design selects a random sample of 278 cities to represent those 827 cities in the 97 MSAs.

Table 5.1 Population and Sample City Percentage in Four Regions

Four Regions	Population City Percent	Sample City Percent
West	33.3% (276)	28.4% (79)
South	23.7% (196)	25.9% (72)
Midwest	28.1% (232)	30.6% (85)
Northeast	14.9% (123)	15.1% (42)
Total	100% (827)	100% (278)

Table 5.1 shows population and sample cities' percentage from four regions. In population city percentage from four regions, each region include: 33.3 percent in West; 23.7 percent in South; 28.1 percent in Midwest; and 14.9 percent in Northeast. In sample city percentage from four regions, each region consists of: 28.4 percent in West; 25.9 percent in South; 30.6 percent in Midwest; and 15.1 percent in Northeast. There is 4.9 percent difference between population and sample cities in the West region. About 2

percent difference between population and sample cities is in the South and Midwest regions, and 0.2 percent difference between population and sample cities is in the Northeast region. Therefore, the 278 sampling cities can represent the 827 population cities in the four regions.

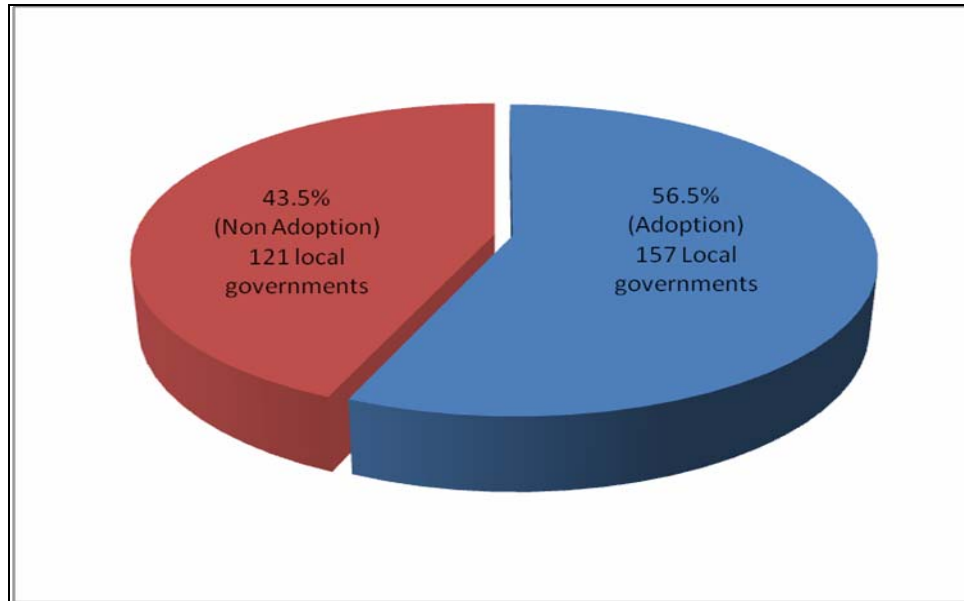


Figure 5.1 Impact Fee Adoptions for 278 local governments in the 97 U.S. MSAs

Figure 5.1 shows Adoption 157 local governments and Non-adoption 121 local governments. This split of 56.5 percent versus 42.5 percent does not differentiate between the variety of names for impact fees, such as capacity fees, facility fees, system development charges, capital recovery fees, Fees-in-Lieu of dedication, development taxes, and availability fees. That is, 56.5 percent of the 278 local governments have at least one or more impact fee types, and 43.5 percent of them do not have any impact fee types.

In the West and South, there were 151 cities; and in the Northeast and Midwest, there were 127 cities. Out of 79 West and 72 South local governments, 67 local

governments adopted impact fees in West, and 49 local governments adopted impact fees in South; that is, this percent represents 84.8 percent of West and 68.1 percent of South. Out of 127 local governments in the Midwest and Northeast regions, there were 50 local governments in Midwest and 36 local governments in Northeast. 35 local governments (41.2 percent) have impact fees in Midwest, and 6 local governments (14.3 percent) have impact fees in Northeast.

Table 5.2 278 Local Governments' Impact Fee Adoption in Four Regions

	Impact Fee Adoption Cities	Non Impact Fee Adoption Cities	Total Cities
West (13 States)	67 (84.8%)	12 (15.2%)	79
South (16 States)	49 (68.1%)	23 (31.9%)	72
Midwest (12 States)	35 (41.2%)	50 (48.8%)	85
Northeast (9 States)	6 (14.3%)	36 (85.7%)	42

5.2 Data Analysis

The method for data analysis is two binary logistic regression models to explain the characteristics of cities that adopted impact fees in U.S metropolitan areas. This research mainly uses results for Model I. For Model II, the size of cities is divided into four category variables such as 1) 25,000-50,000, 2) 50,000-100,000, 3) 100,000-250,000, and 4) over 250,000 to explain the relationship between the size of population and impact fee adoption. The hypotheses derived from the binary logistic regression were tested using the 278 cities representing those 827 cities having over population 25,000 in the 97 MSAs having more than 500,000 populations. The 278 cities' characteristics are examined to uncover: variations in forms of government; geo-demography of city; housing; local financial conditions; and local economic conditions.

Binary logistic regression analysis identifies the relationship between impact fee adoption and the overall characteristics of cities using cross-section data. For the binary logistic regression model analysis, means and standard deviations of independent variables are shown in Table 5.3.

Table 5.3 Means and Standard Deviations of Independent Variables

	157 Cities with adopting Impact Fees		121 Cities without adopting Impact Fees		278 Cities	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Manager Home Rule Charter	.48	.50	.39	.48	.44	.49
Manager Non-Home Rule Charter	.31	.46	.16	.36	.24	.42
Mayor Home Rule Charter	.13	.34	.36	.48	.23	.42
Population2000/1000	136.27	307.06	86.38	117.21	114.5	244.26
Rate of growth in population 1990-2000	30.12	32.21	8.23	14.14	20.59	28.09
Age of City	97.85	56.82	130.13	71.06	111.9	65.29
Cities in West and South Regions	.75	.43	.28	.451	.55	.49
Mean ratio of single family dwelling unit permit divided by the total dwelling unit 1996-2000	70.27	25.23	64.88	29.01	67.94	27.02
Growth in homeownership rate1990-2000	2.67	3.99	.61	2.41	1.77	3.54
Rate of growth in median value of owner occupied housing unit 1990-2000	40.97	29.39	38.75	34.95	40.00	31.89
Debt Per Capita 2001-2002	1848.00	1629.58	1513.68	1612.15	1701	1627.43

Table 5.3 - *Continued*

Ratio of Road Park Water and Sewer expenditure divided by total revenue 2001-2002	26.98	10.76	24.65	13.2	25.96	11.92
Rate of growth in median household income 1990-2000	42.29	13.46	35.43	10.37	39.30	12.66
Rate of growth in the number of employment 1990-2000 divided by rate of growth in housing unit 1990-2000	1.99	19.64	.953	16.07	1.54	18.15
Mean unemployed rate 1990-2000	3.27	1.09	3.89	1.59	3.15	1.36

In the binary logistic regression model analysis, the results are shown in Table 5.4 and Table 5.5 Binary Logistic Regression Estimates in Impact Fees Adoption Model I, II:

Table 5.4 Binary Logistic Regression Estimates in Impact Fees Adoption for Model I

	B	S.E.	Wald	df	Sig.	Exp(B)
Constant	.118	1.627	.005	1	.942	1.125
Manager Home Rule Charter	.584	.600	.947	1	.330	1.793
Manager Non-Home Rule Charter	.121	.629	.037	1	.847	1.129
Mayor Home Rule Charter	.952	.664	2.058	1	.151	2.591
Size of Population divided by 1000	.004	.002**	5.408	1	.020	1.004
Rate of growth in population 1990-2000	.035	.012***	8.619	1	.003	1.036
Age of City	-.007	.003**	4.317	1	.038	.993
Cities in West and South Regions	1.454	.386***	14.204	1	.000	4.282

Table 5.4 - *Continued*

Mean ratio of single family dwelling unit permit divided by the total dwelling unit 1996-2000	-.007	.007	1.191	1	.275	.993
Growth in homeownership rate 1990-2000	.134	.065**	4.256	1	.039	1.143
Rate of growth in median value of owner occupied housing unit 1990-2000	-.015	.007**	4.364	1	.037	.986
Debt Per Capita 2001-2002	.009	.021	.210	1	.647	1.010
Ratio of Road Park Water and Sewer expenditure divided by total revenue 2001-2002	.000	.000	1.373	1	.241	1.000
Rate of growth in median household income 1990-2000	.002	.015	.020	1	.887	1.002
Rate of growth in the number of employment 1990-2000 divided by rate of growth in housing unit 1990-2000	.004	.008	.270	1	.603	1.004
Mean unemployed rate 1990-2000	-.522	.166***	9.852	1	.002	.593
N	278					
Log Likelihood	235.400					
Pseudo R square	.504					
Chi 2	123.385					

Note. *P= < .1; **P= < .05; ***P= < .01. Two-tailed significance tests

Table 5.5 Binary Logistic Regression Estimates in Impact Fees Adoption for Model II

	B	S.E.	Wald	df	Sig.	Exp(B)
	-2.55	1.969	1.683	1	.195	.078
Manager HomeRule Charter	.584	.608	.924	1	.336	1.793
Manager Non-Home Rule Charter	.103	.633	.026	1	.871	1.108

Table 5.5 – *Continued*

Mayor Home Rule Charter	.929	.648	2.056	1	.152	2.531
<u>Population 25000 to 50000</u>	<u>1.263</u>	<u>.724*</u>	<u>3.048</u>	<u>1</u>	<u>.081</u>	<u>3.536</u>
<u>Population 50000 to 100000</u>	<u>1.537</u>	<u>.727**</u>	<u>4.469</u>	<u>1</u>	<u>.035</u>	<u>4.650</u>
<u>Population 100000 to 250000</u>	<u>1.162</u>	<u>.769</u>	<u>2.286</u>	<u>1</u>	<u>.131</u>	<u>3.198</u>
Rate of growth in population 1990-2000	.036	.012***	8.837	1	.003	1.037
Age of City	-.006	.003*	3.535	1	.060	.994
Cities in West and South Regions	1.457	.381***	14.600	1	.000	4.292
Mean ratio of single family dwelling unit permit divided by the total dwelling unit 1996-2000	-.011	.007	2.279	1	.131	.990
Growth in homeownership rate 1990-2000	.135	.065**	4.402	1	.036	1.145
Rate of growth in median value of owner occupied housing unit 1990-2000	-.013	.007*	3.585	1	.058	.987
Debt Per Capita 2001-2002	.000	.000	2.337	1	.126	1.000
Ratio of Road Park Water and Sewer expenditure divided by total revenue 2001-2002	.006	.015	.187	1	.666	1.006
Rate of growth in median household income 1990-2000	.008	.020	.149	1	.699	1.008
Rate of growth in the number of employment 1990-2000 divided by rate of growth in housing unit 1990-2000	.003	.008	.106	1	.744	1.003
Mean unemployed rate 1990-2000	-.441	.162***	7.428	1	.006	.643
N	278					
Log Likelihood	240.848					
Pseudo R square	.486					
Chi 2	117.937					

Note. *P= < .1; **P= < .05; ***P= < .01. Two-tailed significance tests

The above Table 5.4 discloses that cities having impact fees do not relate to the overall forms of local government such as manager and home rule charter, manager and non-home rule charter, and mayor and home rule charter. However, cities with impact fees highly relate to the geo-demographic variables such as size of population, population growth rate, age of city, and the location of city in West and South or Midwest and Northeast. For the housing findings, the number of single family dwelling unit permits issued does not affect the adoption of impact fees; however, the homeownership rate and median dwelling unit value relate to impact fee adoptions. Cities with impact fees do not relate to local financial conditions such as debt per capita and ratio of infrastructure expenditure divided by total revenue. In local economic conditions, cities with impact fees do not relate to economic growth such as median household income and employment growth divided by residential dwelling unit growth; however, those cities having lower unemployment rates are more likely to adopt impact fees.

5.2.1 Forms of Local Government

To explain the relationship between forms of local government and impact fee adoption, the integrated form of government consists of four sets of independent variables: Manager-Charter, Manager-Non Charter, Mayor-Charter, and Mayor-Non Charter. Each form of local government is developed as a dummy variable. In general, the forms of local governments fail to reject the null hypotheses to explain impact fee adoption in 278 cities. The direction of the coefficient estimates is positive as predicted; however, Manager-Charter, Manager-Non Charter, and Mayor-Charter are not

statistically significant at the 0.05 significance level. Government forms are not a related variable to adopting impact fees.

5.2.2 Geo-demographic characteristics of Cities

In Model I, to explain the relationship between whether a local government adopts impact fees and the size of population is divided by 1000. The size of population is statistically significant at the 0.05 significance level. That is, .4 percent change in odds for every 1-unit increase in the size of population is divided by 1000, holding all other independents fixed.

In Model II, to explain the relationship between the adoption of impact fee and the four size of population such as 25,000-50,000, 50,000-100,000, 100,000-250,000, and over 250,000. The size between population 25,000 and 50,000 is statistically significant at the 0.1 significance level. That is, 253.6 percent change in odds for every 1-unit increase in the size of population between 25,000 and 50,000, holding all other independents fixed. The size of population between 50,000 and 100,000 is statistically significant at the 0.05 significance level. That means that 365 percent change in odds for every 1-unit increase in the size of population between 50,000 and 100,000, holding all other independents fixed. By contrast, the two sizes of population between 100,000 and 250,000, and population over 250,000 are not statistically significant at the 0.05 or the 0.1 significance level. From the findings of this research, cities having small and middle-small population are more likely to adopt impact fees to pay for cities' growth.

Rate of growth in population between 1990 and 2000 reject the null hypotheses to explain impact fee adoption in 97 MSAs. That is, rate of growth in population

between 1990 and 2000 is strongly statistically significant at the 0.01 significance level. 3.6 percent change in odds for every 1-unit increase in rate of growth in population between 1990 and 2000, holding all other independents fixed.

Age of cities also reject the null hypotheses to explain impact fee adoption in 97 MSAs. Age of cities is statistically significant at the 0.05 significance level. Old age cities are less likely to adopt impact fees than young cities in 97 MSAs because the direction of the coefficient estimates is negative as predicted. -0.7 percent change in odds for every 1-unit increase in age of cities, holding all other independents fixed.

Cities in West and South regions reject the null hypotheses to explain impact fee adoption in 97 MSAs. Cities in West and South regions are more likely to have impact fees than Cities in Midwest and Northeast regions. Cities in West and South regions are highly statistical significant at the 0.01 significance level. 341.3 percent change in odds for every 1-unit increase in cities of West and South regions, holding all other independents fixed.

For the geo-demography variables, cities with impact fees are significant size of population, population growth rate, age of city, and location of city in West and South or Midwest and Northeast. Cities with small and middle-small size of population are more likely adopt impact fees than other cities. Population growth rate is also highly statistically significant to impact fee adoption. Also, young cities are more likely to adopt impact fees. Cities in West and South are very higher likely to impact fee adoption than cities in Midwest and Northeast

5.2.3 Housing

Mean ratio of single family dwelling unit permits divided by the total number of dwelling unit permits defined here as the change in new housing production between 1996 and 2000 fails to reject the null hypotheses to explain impact fee adoption in 97 MSAs. Mean ratio of single family dwelling unit permit divided by the total dwelling unit between 1996 and 2000 is not statistically significant at the 0.1 significance level. That is, single family dwelling unit permits issued between 1996 and 2000 do not explain local governments' impact fee adoptions in 97 MSAs.

Growth in the homeownership rate between 1990 and 2000 rejects the null hypotheses to explain impact fee adoptions in the 97 MSAs. Growth in the homeownership rate between 1990 and 2000 is statistically significant at the 0.05 significance level. Particularly, 14.4 percent change in odds for every 1-unit increase in homeownership rate between 1990 and 2000, holding all other independents fixed.

Rate of growth in median value of owner occupied housing units between 1990 and 2000 reject the null hypotheses to explain impact fee adoptions for the sampled 97 MSAs. Rate of growth in median value of owner occupied housing unit between 1990 and 2000 is statistically significant at the 0.05 significance level. Accordingly, cities with higher rates of growth in median value of owned-occupied housing units between 1990 and 2000 are less likely having impact fees than other cities because the direction of the coefficient estimate is negative as predicted. -1.5 percent change in odds for every 1-unit increase in median value housing unit between 1990 and 2000, holding all other independents fixed.

In housing, the number of single family dwelling unit permits is not significant in adopting impact fees. Growth in homeownership rate and rate of growth in median value of owner occupied housing unit relate to impact fee adoption.

5.2.4 Local Financial Conditions

To explain the relationship between impact fee adoption and local financial conditions, the independent variables consists of two sets: the ratio of Road Park Water and Sewer expenditure divided by total revenue and mean per capita debt expenditure. In general, the local financial conditions' variables of local governments fail to reject the null hypotheses to explain impact fee adoption in 97 MSAs. Accordingly, the ratio of Road Park Water and Sewer expenditure divided by total revenue and mean per capita debt expenditure as financial characteristics on each city are not significant to explain the local financial conditions.

5.2.5 Local Economic Conditions

Rate of growth in median household income between 1990 and 2000 fails to reject the null hypotheses to explain impact fee adoption in 97 MSAs. Rate of growth in median household income between 1990 and 2000 is not statistically significant at the 0.1 significance level. That is, Rate of growth in median household income between 1990 and 2000 fail to explain local governments' impact fee adoptions in 97 MSAs.

To explain the relationship between rate of growth in employment between 1990 and 2000 divided by rate of growth in of housing units between 1990 and 2000 and impact fee adoption, this independent variable needs an explanation for the relationship between rate of growth in the number of employment between 1990 and 2000 and rate

of growth in housing unit between 1990 and 2000 because the relationship between the two variables holds a high Pearson Correlation score that is the strength of the linear association between the variables at the interval level. To avoid the higher correlation between the variables, the variables are integrated as rate of growth in the number of employment between 1990 and 2000 divided by rate of growth in housing unit between 1990 and 2000 because the both variables relate to local economic growth. Accordingly, rate of growth in the number of employment between 1990 and 2000 divided by rate of growth in housing units between 1990 and 2000 fails to reject the null hypotheses to explain impact fee adoption in 97 MSAs. Rate of growth in the number of employment between 1990 and 2000 divided by rate of growth in housing unit between 1990 and 2000 is not statistically significant at the 0.1 significance level. That is, rate of growth in the number of employment between 1990 and 2000 divided by rate of growth in housing unit between 1990 and 2000 fail to explain local governments' impact fee adoptions in 97 MSAs.

Mean unemployment rate between 1990 and 2000 rejects the null hypotheses to explain impact fee adoptions. The mean unemployment rate between 1990 and 2000 is very statistically significant at the 0.01 significance level. Low unemployment rate relates to the adoption of impact fees. Accordingly, cities with the higher mean rate of unemployment between 1990 and 2000 are less likely to have impact fees than other cities because the direction of the coefficient estimate is negative as predicted. -40.8 percent change in odds for every 1-unit increase in mean unemployment rate between 1990 and 2000, holding all other independents fixed.

In summary, the findings disclose that: 1) cities that adopt impact fees do not relate to the overall forms of local government such as manager and home rule charter, manager and non-home rule charter, and mayor and home rule charter, 2) cities with impact fees highly relate to the geo-demographic characteristics of cities such as small and middle-small size of population, population growth rate, age of city, and the location of city, 3) cities with impact fees do not relate to the number of single family dwelling unit permits issued, but homeownership rate and median housing value relate to impact fee adoptions, 4) local financial conditions such as debt per capita and ratio of infrastructure expenditure do not relate to impact fee adoption, and 5) median household income and employment growth do not relate to impact fee adoption; however, unemployed rate is very significant to impact fee adoption.

5.3 Probability of Impact Fee Adoption

The binary logistic regression directly estimates the probability of an event occurring because there are only two responses for impact fee adoption or not. In this binary logistic regression, the formula below is as follow:

Prediction Equation for Model I,

$$\begin{aligned} Z = & .118 + .004\text{SizeOfPopulationdividedby1000} + .035\text{RateofGrowthInPopulation} - \\ & .007\text{AgeofCity} + 1.454\text{Regions (West and South or Midwest and Northeast)} \\ & + .134\text{ChangeInHomeownershipRate} - .015\text{RateOfMedianValueOfOwner-} \\ & \text{OccupiedHousingUnits} - .522\text{MeanUnemploymentRate} \end{aligned}$$

Table 5.6 Probability of Impact Fee Adoption

	Estimated Coefficient	Hypothesis Value	Product
Manager Home Rule Charter	.584	0	0
Manager Non-Home Rule Charter	.121	0	0
Mayor Home Rule Charter	.952	0	0
Size of Population divided by 1000	.004	114.56	.458
Rate of growth in population 1990-2000	.035	20.59	.720
Age of City	-.007	111.90	-.783
Cities in West and South Regions	1.454	.55	.799
Mean ratio of single family dwelling unit permit divided by the total dwelling unit 1996-2000	-.007	0	0
Growth in homeownership rate 1990-2000	.134	1.77	.237
Rate of growth in median value of owner occupied housing unit 1990-2000	-.015	40.00	-.600
Debt Per Capita 2001-2002	.009	0	0
Ratio of Road Park Water and Sewer expenditure divided by total revenue 2001-2002	.000	0	0
Rate of growth in median household income 1990-2000	.002	0	0
Rate of growth in the number of employment 1990-2000 divided by rate of growth in housing unit 1990-2000	.004	0	0
Mean unemployed rate 1990-2000	-.522	3.15	-1.644

For several predictors, the probability of impact fee adoption can be written as

$$P = 1/1+e^{-Z}$$

The probability of impact fee adoption is as follow:

$$\text{Probability (Non Impact Fee Adoption)} = 1 - \text{Probability (Impact Fee Adoption)}$$

For example, let us calculate the probability of impact fee adoption for Plano city in Texas.

$$\begin{aligned}
&\text{Prediction equation for Plano city, } Z = .118 + .004 (222) \\
&+ .035(72.8) - .007(134) + 1.454(1) + .134(-1.3) - .015(42.24) - \\
&.522(2.3) = 2.0616 \\
&\text{Probability (Impact Fee Adoption)} = 1/1+e^{-2.0616} = 1/(1+.1272) \\
&= .8871
\end{aligned}$$

Therefore, the probability of impact fee adoption is about 88.71 percent. When the probability of impact fee adoption is above .50, we would predict the city of Plano will be adopting impact fees. In another example, let us calculate the probability of impact fee adoption for Des Plaines city in Illinois.

$$\begin{aligned}
&\text{Prediction equation for Des Plaines city, } Z = .118 + .004 (58.7) \\
&+ .035(6.9) - .007(82) + 1.454(0) + .134(-.5) - .015(42) - .522(2.3) = \\
&-1.877 \\
&\text{Probability (Impact Fee Adoption)} = 1/1+e^{1.877} = 1/(1+6.533) = .1327
\end{aligned}$$

Therefore, the probability of impact fee adoption is about 13.27 percent. When the probability of impact fee adoption is below .50, we would predict the city of Plano will not be adopting impact fees. Accordingly, each city can be calculated the probability of impact fee adoption.

CHARTER 6

CONCLUSION AND DISCUSSION

6.1 Conclusion

Over recent decades, local governments have increasingly adopted development impact fees as planning policy, and as an alternative for gaining portions of public infrastructure costs within their geographic and political boundaries. With this trend, the sharing of public infrastructure costs with the private sector has become quite common. Cities with rapid population growth have mitigated fiscal stress to provide public infrastructure. Accordingly, local governments in higher population growth areas all across the U.S. have adopted various types of impact fees in their jurisdictions. In this vein, impact fee adoption is considered as a very important action enabling better long-term financial planning as an aid to comprehensive planning. Even though impact fee planning and policy have caught the attention of scholars and policy makers of local governments for about three decades, impact fee adoptions are relatively new public financial tools to supplement property tax revenues and other fees. Also, impact fee planning and policy arguments have led to issues about the theoretical and actual effects of impact fees. Accordingly, the conclusions of this research add to the debate and, hopefully, help clarify the importance of different city characteristics tending toward adoption. Specific findings about comprehensive impact fee adoptions related to the overall characteristics of cities have been missing (Jeong, 2004) until now.

In this context, the findings from studying the variables of cities as developed in this research, clarify and contribute to the body of knowledge needed before decisions are made about collecting impact fee revenues. That is, inter-related sets of identified variables of cities can add useful information prior to adopting impact fees. For example, impact fees as a regulatory planning and policy financial tool can help local governments control sprawl development (Ridlington & Heavner, 2003). Accordingly, this research finds that the knowledge of overall characteristics of cities is important for planners and policy decision makers of local government prior to adopting impact fees in support of this particular regulatory planning and policy financial tool that levies on new development to make it to pay the sharing costs of infrastructure protect open spaces and sprawl growth with low-density. That is, a comprehensive understanding of the overall characteristics of cities is a useful factor for adopting impact fee planning and policy to manage desirable urban growth or control urban sprawling development.

Empirical evidence for planners and policy-makers of local government about adoption of impact fee planning and policy is discussed in the following section scrutinizing the meaning and significance of the findings in relation to impact fee adoptions. Planning and policy implications for impact fee studies are then addressed in a part of this section. Finally, the limitations of research and further research are suggested for later study.

6.2 Significance of the Research and Discussions

In forms of local government, the discussion of municipal forms focuses on council-manager with professional management compared to mayor-council

government with the separation of power. Also, these two forms of local government are mixed with home rule charter or without. These four categories represent city structures to measure the forms of local government related to impact fee adoptions. According to these findings, the four categories of local government forms generally fail to explain impact fee adoptions in the 97 MSAs. That is, the forms of local government are not significant to the adoption of impact fees.

In studying the geo-demography in cities, this dissertation categorizes four important independent variables such as the size of population, rate of growth in population between 1990 and 2000, age of city, and the location of city in regions such as West and South, or Midwest and Northeast. The size of population is generally significant in relation to impact fee adoptions. According to Frank and Downing (1988), the frequency of impact fee adoptions is highest in small communities; that is, small population cities are more likely adopt impact fees to serve growth. Also, they expected the likelihood of impact fee adoption to be highest in large communities; however, large size of populations may not be a factor leaning toward adopting impact fees due to cities with over population 100,000 is not generally significant in relation to impact fee adoptions. The cities between population 50,000 and 100,000 strongly adopt impact fees in the 97 MSAs. That is, small population cities are more likely to adopt impact fees than large population cities. Frank and Downing (1988) mentioned that the magnitude of population growth rate interacted with impact fee adoption. This research also provides the evidence that the rate of growth in population between 1990 and 2000 is highly significant to adopt impact fees. That is, population growth stimulates local

governments to adopt impact fees in 97 MSAs. Also, age of city is significant to adopt impact fees. Young cities are more likely to adopt impact fees than old cities. Young cities attract more people than old cities in 97 MSAs; that is, it will mean that young cities have higher population growth than old cities in 97 MSAs.

Region variations, where cities are in West and South, or Midwest and Northeast, are very significant to adopt impact fees. That is, the region variable is very close to the variable of population growth. According to U.S. Census Bureau, the West and South regions have an overall 20 percent population growth rate during 1990s, while the Midwest and the Northeast regions have below 9 percent population growth during that time; therefore, the regional variables keep up with population growth rate to adopt impact fees. In general, geo-demography of cities such as size of population, population growth rate, age of city, and city location in its region of the United States are important to explain impact fee adoptions in 97 MSAs.

In housing, this research categorizes the mean ratio of single family dwelling unit permits divided by the total dwelling unit between 1996 and 2000, growth in homeownership rate between 1990 and 2000, and rate of growth in median value of owner occupied housing unit between 1990 and 2000 to explain impact fee adoptions. The mean ratio of single family dwelling unit permits divided by the total dwelling unit between 1996 and 2000 is not significant in adopting impact fees. The number of single family dwelling unit permits does not relate to impact fee adoptions to explain impact fee adoptions even though developers or builders have to pay more impact fees for single family dwelling units rather than multi-family dwelling units. Growth in

homeownership rates between 1990 and 2000 is significant in explaining impact fee adoption. This dissertation shows empirical evidence that cities with impact fees have higher homeownership rates rather than lower homeownership rates. Even though this researcher expected that cities with impact fees would have lower homeownership rates because impact fee adoption would limit on the affordability of housing (Been, 2005; HUD, 2007), cities having higher homeownership rates are more likely to adopt impact fees than others. It will be expected that the cities with impact fees have more upper-middle income than low-middle income households because Been (2005, p. 139) and HUD (2007) argue that impact fee adoption may be critical on limiting housing opportunities for low- and moderate-income groups. Rate of growth in median value of owner occupied housing units between 1990 and 2000 is also significant to explain impact fee adoption. However, cities with lower rates of growth in the median housing value are more likely to adopt impact fees due to the negative direction of the coefficient estimate. It will be explained that cities with impact fees have lower rate of growth in median housing values because their previous median housing value was higher than other cities.

In local financial conditions, there are two independent variables such as debt per capita between 2001 and 2002 and ratio of road park water and sewer expenditure divided by total revenue between 2001 and 2002. Even though these variables to measure the financial conditions of local government relate to impact fee adoptions, the variables generally fail to explain impact fee adoption in 97 MSAs. That is, the financial conditions of local government are not significant to the adoption of impact fee

planning and policy.

For local economic conditions, this dissertation examines three independent variables: 1) rate of growth in median household income between 1990 and 2000, 2) rate of growth in the number of employment between 1990 and 2000 divided by rate of growth in housing unit between 1990 and 2000, and 3) mean unemployed rate between 1990 and 2000. Rate of growth in median household income between 1990 and 2000 is not significant in explaining the adoption of impact fees; that is, both kinds of cities with impact fees and without have the same rate of growth in median household income. Rate of growth in the number of employed between 1990 and 2000 divided by rate of growth in housing unit between 1990 and 2000 is not significant to explain impact fee adoption. The relationship between rate of growth in the number of employed and rate of growth in number of dwelling units has a high correlation, and then, the both variables can explain city growth related to local economic conditions. However, these variables do not provide evidence that impact fee adoptions related to local economic conditions. Mean unemployed rate between 1990 and 2000 is very significant to explain impact fee adoptions. Cities with lower mean unemployed rate between 1990 and 2000 are more likely to adopt impact fees than other cities due to the negative direction of the coefficient estimate. That is, it will be expected that cities with impact fees have upper-middle class with stable jobs because the cities with impact fees will be not industrial cities but satellite bed town cities.

To emphasize their findings, statistical associations indicate that: 1) cities with impact fees do not relate to the forms of local government, 2) cities with impact fees

highly relate to the geo-demographic characteristics of cities as explored here; 3) cities with impact fees do not relate to the number of single family dwelling unit permits issued for new residential development to provide more dwelling units in certain city settings; however, homeownership rate and median housing value relate to impact fee adoptions; 4) cities with impact fees do not relate to local financial conditions; and, 5) cities with impact fees do not relate to economic growth such as employment growth and residential dwelling unit growth; however, those cities having lower unemployed rates are more likely to adopt impact fee planning and policy in the characteristics of local economic conditions.

6.3 Implications for Planning and Public Policy

The overall characteristics of cities affect impact fee planning and policy adoption because adoption of impact fees is most likely to be found in growing city areas (Frank & Downing, 1988; Nelson, 1988; Yinger, 1998; Ihlanfeldt & Shaughnessy, 2004; Jeong, 2004; McDonald and McMillan, 2004). That is, this research has endeavored to develop the understanding of adoption of impact fee planning and policy about the characteristics of cities of U.S. metropolitan regions. The overall characteristics of cities can provide plan and policy maker's new information about what factors local governments should consider and when local decision makers attempt to initiate impact fees to improve infrastructure and public facilities (Jeong, 2004). This dissertation buttresses the significant understanding of impact fee planning and policy adoption with the information of the overall characteristics of their jurisdictions for local decision makers (Carrion & Libby, 2004).

Impact fee planning and policy adoption are both financial and growth management tools used by local governments to pay for additional infrastructure costs and to control the growth of sprawl caused by new developments. According to Rosenberg (2002), although local governments have used fiscal policies such as property tax abatement and TIF (Tax Increment Finance) for economic development and local land use policy such as zoning ordinances to develop a larger tax base, they have turned to impact fees to recover the costs of infrastructure due to urban growth beyond the carrying capacity of existing infrastructure, and requiring the provision of services. Although local governments have applied the previous planning and policy such as property taxes and zoning regulations to control limiting new development to existing infrastructure service areas, it is difficult to meet the costs of new development due to rapid population growth. As one of the solutions to the additional infrastructure costs with urban growth, impact fee adoption as a tool can be characterized as a form of taxation. Generally, adoption of impact fees can be found in infrastructure financial resources of local governments to accommodate urban growth.

However, the process of impact fee planning and policy adoption is vulnerable to challengers within the local decision making process for the share of the cost of local additional infrastructure due to many different actors such as existing and new residents, interest groups such as builders and developers, and local officials. Also, adoption of impact fee planning and policy bring on an equity issue about who really pays for additional infrastructure costs (Ihlandfeldt & Shaughnessy, 2004). That is, as mentioned in Chapter 2 and Chapter 3, new homebuyers don't actually want to pay the burden of

impact fees, and developers and builders will resist the adoption of impact fee planning and policy, or they will try to transfer the burden of impact fees over new homebuyers. After all, adoption of impact fee planning and policy in a competitive housing market results in a higher price paid by new homebuyers (Delaney & Smith, 1989b). Also, if local governments impose higher impact fees on developers and builders, they will stop investments due to the higher impact fees as a part of development benefits imposed on them; thus, local governments will be losing their investments in their jurisdictions. Local governments have to consider the overall characteristics of cities such as political, physical, housing, economic, financial conditions of cities to adopt impact fee planning and policy. Accordingly, adoption of impact fee planning and policy will be reflected on the overall characteristics of cities to accommodate urban growth because local governments are responsible for approving impact fees in their legislative boundaries.

6.4 Contributions

This dissertation is the first researches using nationwide data for impact fee studies, even though there have been only limited impact fee studies for Texas and Florida previously. This dissertation examined the adoption of impact fee planning and policy adoption with regard to the growth of cities in all U.S. metropolitan regional settings. Public Choice theory elucidates local decision making process related to the adoption of impact fee planning and policy. This research investigates the relationship between forms of local government and impact fee adoption. However, forms of local government do not relate to the adoption of impact fees. Also, this dissertation provides empirical evidence for the relationship between homeownership rate and impact fee

adoption in impact fee studies. Cities having impact fees have higher homeownership rates than others. Also, this research has examined other variables. There are the important variables such as population size, population growth rate, region, homeownership rate, housing value, and unemployed rate to explain the adoption of impact fees. Accordingly, these variables can be predictors for any U.S. city considering adopting impact fees in U.S. metropolitan areas. That is, this dissertation has attempted to improve the understanding of adoption of impact fee planning and policy about the characteristics of cities of U.S. metropolitan regions. That is, the overall characteristics of cities can provide planners and policy makers of local governments the significant understanding of adoption of impact fee planning and policy.

Due to large population growth in U.S. metropolitan areas (Perry & Mackun, 2001), most metropolitan area local governments are inevitably faced with urban growth issues in financing their public facilities and infrastructure (Frank & Downing, 1988; Nelson, 1988; Yinger, 1998; Ihlanfeldt & Shaughnessy, 2004). Urban growth has affected most local governments to increase spending on both general revenues and capital facilities in the past decade (Pagano, 2002; Jeong, 2004; Florida Impact Fee Review Task Force, 2006), too. In order to solve local financial problems for financing additional infrastructure costs, impact fee planning and policy adoption are strongly suggested, as fiscal and regulation tools for urban growth management.

6.5 Limitations of Design and Future Research

This dissertation examines the 278 local decisions of 97 MSAs about impact fee adoption related to the overall characteristics of cities in the forms of local government,

geo-demography of city, housing, local financial conditions, and local economic conditions. However, this research design does not include 164 MSAs having below population 500,000 to explore the overall characteristics of cities related to impact fee adoptions. That is, this research does not provide the information of impact fee adoption in 164 small MSAs. Also, this dissertation excludes cities in rural areas outside of MSAs related to impact fee adoptions. To explore what overall characteristics of cities of U.S. adopt impact fees, further research would need to include information of impact fee adoption across U.S to compare between rural and urban areas or non-metropolitan and metropolitan areas.

Even though local governments adopt impact fee planning and policy adoption to avoid fiscal stresses for providing infrastructure, the relationship between local financial conditions and impact fee adoption is not empirically tested. Accordingly, additional financial information will be required to build a better model design that investigates the relationship between the amount of impact fees and total revenues or expenditures. Nelson and Moody (2003) argued that the relationship between impact fees and local economic development was positive; that is, they argued that infrastructure improvements bring job growth. However, this research found that this relationship is not significant. Future research will need to examine additional variables related to the relationship between local economic growth and impact fees.

For the further research, consequences of local financial conditions and economic conditions related to impact fee planning and policy need to be addressed. The time frame for this research is a relatively short number of years 1990-2000, and

may not be typical. However, the sample period of between 1990 and 2000 was over 13 years later than the first adopted impact fee legislation in Florida, and in those years the wave of adoption and increased population should uncover current metropolitan area local governments' trends. Further research will be needed obtaining more rich data for a longer period. Population growth is centered on impact fee adoption in this dissertation. However, the population growth must be separated into more categories such as Hispanic growth, Black growth and Asian growth, or immigrants to explain impact fee adoption because Black suburbanites grew up to 38 percent, and Asians and Hispanics rapidly grew up to 72 percent and 84 percent respectively in U.S. metropolitan suburban areas during the 1990s (Logan, 2001). Using the detailed variables of population growth, future research can better address and examine the demographic consequences of impact fees (Been, 2005).

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