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# Adaptive Reuse of Religious Buildings in the U.S.: Determinants of Project Outcomes and the Role of Tax Credits

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# ADAPTIVE REUSE OF RELIGIOUS BUILDINGS IN THE U.S: DETERMINANTS OF PROJECT OUTCOMES AND THE ROLE OF TAX CREDITS

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# ADAPTIVE REUSE OF RELIGIOUS BUILDINGS IN THE U.S: DETERMINANTS OF PROJECT OUTCOMES AND THE ROLE OF TAX CREDITS

EUGENE CHOI

## ABSTRACT

Adaptive reuse of historic buildings generates many tangible and intangible benefits. These benefits are not limited to the initiator (usually the developer) but are expanded to the community and the local government. This dissertation empirically investigates the role of tax credits in initiators' decisions to reuse religious buildings and their choice of reuse project outcomes, including the federal historic preservation tax credit, the low income housing tax credit, and the new market tax credit. Theses tax credits are the most commonly used tax credits in historic preservation projects. In addition, this dissertation also tests whether or not religious buildings were designated as the national historic places have affected initiators' decision to reuse religious buildings and in initiators' choices of reuse project outcomes. As far as I know, this is the first academic dissertation that tests these factors as reuse determinants.

To test hypotheses of this dissertation, both the multiple-case study and statistical analyses were used. Five religious buildings that have been reused for different purposes are considered: the Meridian Street Methodist Episcopal Church in Indianapolis, IN; the Notre Dame Academy in Cleveland, OH; the Ashbury Delaware Methodist Church in Buffalo, NY; the First Church of Christ Scientist in Cleveland, OH; and the Orthodox

Jewish Congregation – Cheva Bikur Cholim in Seattle, WA. In-depth interviews with developers were used to determine the important factors that drove their investments in the reuse projects.

In addition, multinomial logit regressions were run using individual religious buildings reused for different purposes or religious purposes as the unit of analysis. Religious buildings sold to other religious entities were set as a reference category, meaning I compared religious buildings sold to other religious entities with each reuse outcome including condominiums, offices, retail space, low income housing, school, cultural place and undeveloped religious buildings.

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# CHAPTER I

# INTRODUCTION

## *1.1 The Statement of Problem*

Adaptive reuse of historic buildings generates many tangible and intangible benefits. These benefits are not limited to the initiator (usually the developer) but also accrue to the community and local government. Developers can save considerable project costs when they initiate reuse projects because they can develop the building without demolition costs and minimize building costs since existing buildings tend to be reused. For public consideration, local government can protect their environments because adaptive reuse projects generate much less waste in their neighborhood than new construction projects. Adaptive reuse can create valuable community resources

from unproductive property, substantially reduce land acquisition and construction costs, revitalize existing neighborhoods, and help control sprawl (Bullen, 2007). In addition, adaptive reuse of existing abandoned buildings can be used as tool to revitalize urban area through job creation, tax revenues and historic preservation.

Although the reuse and adaptation of historic buildings is a popular trend, there is little empirical research dealing with the initiator's[1] decision to redevelop historic buildings and their choice of reuse outcomes. Internal and external factors that affect an initiator's decision to redevelop historic buildings and their choice of reuse outcomes have not been duly investigated by academic studies.

There is only one research article dealing with this issue. Simons and Choi (2010, forthcoming) determined factors that affect reuse outcomes comparing condominiums to other reuse outcomes such as apartment, cultural uses, offices and retail places. However, the study missed several core factors that should be analyzed, including the role of public subsidies on the decision making process of project initiator, historic value and architectural significance of the property, and local commercial market absorption. The study also lacked a non-developed control group.

[1] Initiators in this dissertation include not only private developers but also public agencies who invest their capital on reuse projects of redundant religious buildings. Redundant religious buildings can be redeveloped as condominiums, offices, retail space, rental housing, schools or cultural places.

*1.2 Justification and Contributions of the Dissertation*

The role of neighborhood religious buildings has evolved from providing a site for only spiritual counsel to becoming a social service center to becoming a factor in economic and real estate development (Reese, 2004; Mian, 2008). In other words, economic benefits and redevelopment opportunities are highlighted as the critical purpose of neighborhood religious buildings in the contemporary communities (Mian, 2008). Moreover religious buildings in the United States are closely related to cultural identities of neighborhoods. Therefore, although religious buildings have been suffered from maintaining its congregation because population is on the decrease it is good to preserve and keep religious buildings.

Once they become available on the markets, religious buildings in the United States are attractive to investors who seek adaptive reuse projects because such buildings tend to retain features that are linked with the history of a neighborhood. These features are translatable into financial benefits for the developers and general public. Therefore, initiators of these projects have increasingly sought to convert historic, underused religious buildings into residential housing, retail centers, and office space, particularly when they believe that the style of the building has the potential to produce increased profits and other benefits.

Although the change to reuse and adaptation of historic religious buildings is a world wide trend, there is little empirical research dealing with adaptive reuse projects of historic religious buildings. Simons and Choi (2010, Forthcoming) identified factors

that affect the outcomes of reuse of churches and schools. However, they did not consider policy factors that affect reuse plans. These policy side factors include public subsidies like tax credits and also include historic designation.

Changes to planning and development policies of local government allow more reuse opportunities for both public and private initiators by providing public subsidies and designating buildings as historic places. In addition, their paper did not analyze the effects of local commercial market factors such as retail and office occupancy rates on project outcomes.

This dissertation investigates the role of tax credits in initiators' decisions to reuse religious buildings and their choice of reuse project outcomes, including the federal historic preservation tax credit, the low income housing tax credit, and the new market tax credit. These tax credits are the most commonly used tax credits in historic preservation projects (Saurwein and Simons, Forthcoming). In addition, this research also tests whether or not religious buildings were designated as the national historic places have affected initiators decision to reuse religious buildings and in initiators choice of reuse project outcomes. It is my belief that this is the first academic dissertation or scholarly work that tests these factors as reuse determinants.

### *1.3 The Purpose of the Dissertation and Research Questions*

The purpose of this dissertation is to determine factors that affect outcomes of religious building reuse projects in the United States. Simons and Choi (2010,

forthcoming) tested only location factors, building characteristics, and demographic factors. Several other factors were missing that might have an impact on a choice of outcome for a religious building reuse project. For example, historic value and architectural significance may play in an initiator's decision to choose a reuse outcome. Furthermore, local commercial market conditions, such as retail or office occupancy rates, may also affect the decisions.

This dissertation mainly tests the effects of historic designation at the national level and local commercial market condition, including inquiry as to the effect of tax credits such as the federal historic preservation tax credit, the low income housing tax credit and the new market tax credit, on choices of outcomes of religious building reuse projects. Three major research questions drive the effort:

1. Are local commercial market conditions such as retail and office occupancy rate important factors that determine choices of reuse project outcomes of religious buildings?
2. Is the national level historic designation an important factor that determines choices of reuse project outcomes of religious buildings?
3. Are federal tax credits such as the historic preservation tax credit, the low income housing tax credit and the new market tax credit important factors that determine choices of reuse project outcomes of religious buildings?

Historic designations are proxies of the historic value and architectural significance of the properties. Many historic religious buildings in the United States built around the 1900s or earlier have important and distinct architectural styles. The historic values attached to architectural significances are core factors that make religious buildings more attractive. Historic places can be designated at the national level, state level, and local level. Historic designations give owners of historic places an advantage in the competitive process of grant application and create an identifiable voice in community affairs. Although historic designations restrict development opportunities of owners, the historic designations make historic buildings more attractive to initiators.

Public subsidies are very important in the developer or initiator's decision to invest his or her capital on the project. In many cases, the federal historic preservation tax credit, the low income housing tax credit, and the new market tax credit have been used to finance the project. If the developer (or public initiator) would like to redevelop the property they may consider the availability of tax credits

*1.4 Organization of this Dissertation*

Chapter II addresses literature review of this dissertation. The first part of Chapter II addresses background information that is useful to general study of the reuse problems, including discussion of the concept of adaptive reuse, reasons for redundant religious buildings, and advantages of adaptive reuse projects compared to new constructions. The concept of adaptive reuse is compared to concepts of preservation,

restoration and reconstruction. In addition, the chapter addresses why there are redundant religious buildings in the United States, focusing on issues of suburbanization, immigration, and decline in religiosity as well as the advantages and motives of adaptive reuse projects of historic buildings are addressed focusing on development costs, urban sustainability, historic preservation, urban revitalization, and providing low income housing. The second part of Chapter II provides a review of relevant literature on factors that affect the initiators' decisions to reuse or redevelop historic buildings and initiators' choice of reuse outcomes. Call option theory is offered to understand reuse outcomes of religious buildings. Other internal and external factors that affect adaptive reuse outcome of historic buildings are also addressed. Internal factors include building characteristics, seller's denomination, and national level of historic designations. External factors include location features, demographic shifts, local commercial market conditions, macro-economic trends and historic designation. The role of tax credits including the federal historic preservation tax credit, low income housing tax credit and new market tax credit also are addressed in the later part of Chapter III.

Chapter III addresses multiple religious building reuse cases focusing on market conditions, historic values and architectural significance, as well as uses of public subsidies such as tax credits. Five religious buildings that have been reused for different purposes are discussed in Chapter III: the Meridian Street Methodist Episcopal Church in Indianapolis, IN; the Notre Dame Academy in Cleveland, OH; the Ashbury Delaware Methodist Church in Buffalo, NY; the First Church of Christ Scientist in Cleveland, OH;

and the Orthodox Jewish Congregation – Cheva Bikur Cholim in Seattle, WA. To address issues on market conditions, historic values, architectural significance, and uses of public subsidies, the concept of the project, site history, market condition and financing issues are investigated.

Chapter IV addresses a conceptual framework of reuse options and the research hypotheses of this dissertation, focused primarily on the effects of local commercial market conditions, the national historic designations, and tax credits including the historic preservation tax credit, the low income housing tax credit and the new market tax credit on initiators choice of outcomes of religious building reuse projects. Reuse project outcomes are divided into eight types based on Simons and Choi's (2010, forthcoming) division: undeveloped religious buildings (undeveloped; on the market), religious buildings sold to other religious entities (church to church), condominiums (condo), offices (office), retail places (retail), low income housing (LIH), schools (school) and cultural uses (cultural).

Chapter V introduces the research methods used in this dissertation: a multiple-case study and a statistical analysis. The information and discussions of each case study is provided in Chapter III. The statistical analysis utilizes several multinomial logit models using individual religious buildings reused for different purposes, on the market, and sold to other religious entities as the unit of analysis.

Chapter VI addresses the findings from case studies and statistical models. Chapter VII concludes the dissertation, summarizing the major findings, offering policy

implications, and suggesting future research. Multinomial logit regressions were run using individual religious buildings reused for different purposes or religious purposes as the unit of analysis. Religious buildings sold to other religious entities were set as a reference category, meaning I compared religious buildings sold to other religious entities with each reuse outcome including condominiums, offices, retail space, low income housing, school, cultural place and undeveloped religious buildings. This dissertation has found statistically significant effects of the national historic district on choices of outcomes of religious building reuse projects, found that the historic preservation tax credit has been positively associated with offices, retail and low income housing plans. I also found that the new market tax credit has been positively associated with retail space while a relationship between the new market tax credit and office was not found.

# CHAPTER II

# LITERATURE REVIEW

This chapter discusses previous literature. The first part of Chapter II discusses background information about adaptive reuse projects. This includes the concept and definition of adaptive reuse, reasons for redundant religious buildings, and advantages behind adaptive reuse projects as compared to new constructions. Definitions of associated concepts, such as preservation, restoration and reconstruction, are also discussed. This chapter speaks to concerns of parishioners, private developers, and public agencies involved in urban redevelopment in terms of strategies for historic buildings that are underused or abandoned.

The second part of Chapter II discusses about relevant literature that has

mentioned factors that affect initiators decision to invest their capital on historic building preservation and restoration projects. There is a lack of quantitative studies that have tested factors that affect an initiator's decision to preserve or repurpose the function of an historic building. Therefore, the literature review of this dissertation mainly relies on conceptual level work. Chapter II shows why reuse of religious buildings is an application of the call option theory based on previous literature. The framework of this dissertation is driven by the call option theory, meaning that if a religious building was converted into a certain purpose, the option belonging to the developer has been exercised. In later part of the chapter, internal and external factors that might affect the choice of adaptive reuse outcomes of historic buildings are addressed. Based on previous literature, internal factors include building characteristics, seller's denomination and historic status. The external factors include location characteristics, demographic shifts and macro-economic conditions. External factors are proxies of market demand. In addition, the role of tax credits, including the federal historic preservation tax credit, low income housing tax credit, and new market tax credit in choice of reuse outcomes are addressed in the final part of this chapter.

## *2.1 Background Information*

### *2.1.1 Definition of Adaptive Reuse and Similar Terms*

Tyler (2000) stated that for historic buildings needing repair, alteration, or an addition, there are four typical types of intervention: preservation, restoration,

reconstruction and adaptive reuse. Each intervention strategy almost always involves some loss of a ‘value’ in the historic buildings, but it is justified in order to preserve the objects for the future (Tyler, 2000).

The term preservation refers to the maintenance of a property without significant alteration to its current condition. This approach should be taken when it is appropriate to maintain a building ‘as is.’ A building changes over its lifetime and each change represents a part of its history and integrity; preservation accepts those changes but maintains its historic integrity and as many of the original features as possible. When preservation is the appropriate strategy, the only intervention is normal maintenance or special work needed to protect the building against further damage (Tyler, 2000).

Restoration refers to the process of returning a building to its condition at a specific point in time, often to its original condition. Restoration of a building is appropriate when portions of a building’s historic integrity are lost or where its importance at one time was particularly significant. A decision made to restore a building to a defined time period recognizes that importance. This decision must be made carefully, for its means ignoring the natural evolution of the building and creating, essentially, a contrived picture of its survival. However, if a building has a past of great significance, then restoration may be justified (Tyler, 2000).

The term reconstruction means the building of a historic building using replicated design and/or materials. This approach is taken when a historic building no longer exists but needs to be physically in place for contextual reasons (Tyler, 2000).

Many historic buildings are no longer viable in their original functions and use but retain their architectural integrity. For these buildings, a common type of intervention is rehabilitation, also referred to as adaptive reuse. Adaptive reuse offers a suitable approach when existing historic buildings are damaged or deteriorated but modification can be made to update portions of the building, even adapting the building for a new purpose. Adaptive reuse is as a process that retains as much as possible of the original building while upgrading the performance to suit modern standards and changing user requirements (Latham, 2000). Generally, the most radical changes are made on the interior, where more latitude may be taken to adapt the building without altering its outward appearance. To maintain the building's historic integrity, however, exterior changes are generally minimal (Tyler, 2000).

### *2.1.2 Reasons for Redundant Religious Buildings*

#### *2.1.2.1 Suburbanization*

Residents of core urban areas have followed a trend over the past four decades of suburbanization; they pack and moving van, load up the kids and the dog, and relocate to a detached, single family home. This trend of suburbanization has influenced many urban landscapes. Using the slope of the density function as a measure of centralization, Thurston and Yezer (1994) found that suburbanization of the residential population is enhanced by rising income and suburbanization of employment in the transportation, communication, and public utilities and service sectors, as well as a

failure of the manufacturing sector to decentralize.

Suburbanization has also influenced the religious landscape. While more and more religious buildings are being left empty in urban areas, new religious buildings are built to accommodate people living in the recently constructed suburban communities (Ledebur and Choi, Forthcoming). Suburbanization has influenced industrial landscape in the central cities. As the central cities in the US have experienced suburbanization US cities have faced deindustrialization. Deindustrialization brings with it a decline in attitudes towards religions, as well as an increase in the redevelopment activities of religious structures (Mian, 2008). According to Mian (2008), as businesses returned to the city, so did middle-class residents who took up housing in the central city. The character of many neighborhoods changed as the new, wealthier populations displaced long-term residents by purchasing and upgrading housing. Mian (2008) argued that deindustrialization further accelerated already declining religious beliefs and practices. New urban residents brought not only wealth but a culture that is educated and characterized by freedom and individuality. Thus, certain religions and religious entities in the city became further marginalized.

*2.1.2.2 Immigration and Migration*

Immigration and migration are important factors that affect redundant religious buildings in the United States (Mian, 2008; Ledebur and Choi, Forthcoming). New residents from developing countries are replacing American residents and changing the

religious landscape of core urban areas. They have settled in the inner cities and attend churches run by their own countries' religious leaders rather than joining existing American religious entities. As a consequence, the traditional American religious structures are underused in urban areas. Some of the structures affected by the changing landscape of religion are sacred landmarks. Many are at risk, some are lost, but still others are saved through adaptations to other uses. Furthermore, the landscape of urban places is replete with new houses of worship built to house new or relocating congregations. Some of these new religious structures may be considered sacred landmarks in the future (Ledebur and Choi, Forthcoming).

*2.1.2.3 Decline in Religiosity and Denominational Shifts*

A decline in religiosity may affect redundant religious buildings. According to the U.S. Religious Landscape Survey (2008) released by the Pew Forum on Religion and Public Life, more than one-quarter of American adults (28%) have left the faith in which they were raised in favor of another religion – or no religion at all.

Ledebur and Choi (Forthcoming) also pointed out that denominational shifts explain other seeming incongruities; people may move geographically from the city to the suburb, but a concurrent trend is the move from old-line protestant (and to some extent Catholic) denominations to the Pentecostal or evangelistic religion of the mega-churches that are now ubiquitous on the fringes of American cities. In addition, they stated that these churches attempt to address social, psychological, and community needs

of congregants, as well as their spiritual needs, much more comprehensively than many traditional churches. These new institutions often include large buildings called “family centers” which may offer a smorgasbord of recreational, social, and personal growth activities directed at the whole family.

Table 2-1 shows the net loss in terms of the number of congregations and religious adherents between 1980 and 2000. The number of congregations is not the same of the number of religious buildings, but it can serve as a rough proxy for the number of religious buildings. The United Methodist Church lost around 2,700 congregations in the period, followed by the Presbyterian Church (USA) losing around 1,500, and the Christian Church (Disciples of Christ) experiencing a net loss of about 900 congregations. I may assume that the losses by the denominations have resulted in a number of religious buildings placed on the market.

Table 2-1 Net Loss in the Number of Congregations (Top 10): 1980-2000

| Religious Bodies | Congregations (Net Change) | Adherents (Net Change) | % Change (Adherent) |
|---|---|---|---|
| United Methodist Church | -2,688 | -1,172,612 | -10% |
| Presbyterian Church (USA) | -1,509 | -855,006 | -21% |
| Christian Church (Disciples of Christ) | -906 | -185,930 | -15% |
| Catholic Church | -486 | 12,000,000 | 32% |
| United Church of Christ | -465 | -384,164 | -18% |
| American Baptist (USA) | -187 | -143,262 | -8% |
| Baptist Missionary Association of America | -72 | 24,713 | 9% |
| Evangelical Lutheran Church in America | -52 | -252,733 | -5% |
| Cumberland Presbyterian Church | -49 | -10,388 | -12% |
| Free Methodist Church of North America | -3 | -103,053 | -52% |

Source: ARDA (Data originally gathered for the forthcoming book "No Building Left Behind: New Uses for America's Churches and Schools by Robert A. Simons, Larry Ledebur and Gary DeWine, Washington D.C.: Urban Land Institute)
Note: The number of Catholic adherents between 1980 and 2000 obtained from ARDA appears overestimated as compared to the number obtained from the Catholic Information Project (CIP) survey conducted by United States Conference of Catholic Bishops in 2006. Data from the CIP was used rather than numbers from ARDA, giving an approximately 12 million net gain in adherents between 1980 and 2000.

Table 2-2 shows the net gain in terms of the number of congregations and adherents between 1980 and 2000. The Southern Baptist Convention led the net change of adherents between 1980 and 2000, followed by Church of Jesus Christ of Latter-Day Saints, Assemblies of God, and National Association of Free Will Baptists. On the other hand, the International Church of the Foursquare Gospel shows the highest percentage gain between 1980 and 2000 (119%), followed by Assemblies of God (60%) and Church of Jesus Christ of Latter-Day Saints (58%).

Although the number of adherents affiliated with the Catholic Church has increased, Catholics had a net loss in terms of the number of congregations between

1980 and 2000. However, more recent data indicates that a potential reversal to this trend. According to Catholic Information Project conducted by United States Conference of Catholic Bishops (2006), the number of congregations (i.e., parishes) has increased 1% from 2000 to 2004. Although the number of congregations has increased during this period, fewer parishes opened their doors, compared to the increased rate of Catholic adherents. It seems that the nearly flat increase rate in the number of parishes is caused by parish closings, merger, or consolidation policies, typically mandated by a hierarchical organizational structure at the metropolitan level, and can be attributed to population loss in urban areas. Many dioceses, such as Buffalo and Cleveland, promulgate closing or merger policies with regard to disposition of parish assets and liabilities (Ledebur and Choi, Forthcoming).

Table 2-2 Net Gain in the Number of Congregations (Top 10): 1980-2000

| Religious Bodies | Congregations (Net Change) | Adherents (Net Change) | % Change (Adherent) |
|---|---|---|---|
| Southern Baptist Convention | 6,061 | 3,668,418 | 23% |
| Church of Jesus Christ of Latter-day Saints | 4,882 | 1,557,003 | 58% |
| Assemblies of God | 2,498 | 955,497 | 60% |
| National Association of Free Will Baptists | 2,466 | 254,170 | NA |
| Jewish (all denominations) | 2,246 | 220,425 | 3.6% |
| Church of God of Prophecy | 1,858 | 91,106 | NA |
| Wesleyan Church | 1,657 | 381,459 | NA |
| Pentecostal Church of God | 1,173 | 101,921 | NA |
| Independent, Non-Charismatic Churches | 1,084 | 1,116,769 | NA |
| International Church of the Foursquare Gospel | 1,045 | 188,668 | 119% |

Source: ARDA (Data originally gathered for the forthcoming book “No Building Left Behind: New Uses for America’s Churches and Schools” by Robert A. Simons, Larry Ledebur and Gary DeWine Washington D.C.: Urban Land Institute)

Appendix T includes the change rates of the number of congregations by state[2].Nevada had the highest increase rate in the number of congregations between 1980 and 1990 (49.3%), followed by Utah (44.3%), Hawaii (41.9%), and Alaska (40.8%). The states with the lowest rate of change during the same period are North Dakota with an 8.5% *decrease* in the number of congregations, followed by Delaware (0% change) and West Virginia (0.9% increase). Regarding the net change in the number of congregations between 1980 and 2000, California, Florida, and Texas are the top three states with approximately 5,700, 3,900 and 2,800 net congregation gains, respectively, followed by New York (2,100) and Utah (1,900). By contrast, North Dakota had the greatest net loss (-128) followed by Delaware (even) and West Virginia, which gained only 36 congregations. The number of congregations per person shows little relationship to the outright numbers of congregations. For example, no states with a large number of religious entities are included in the top 10 for congregations per person. The state with the highest ratio of churches per person is North Dakota with 0.00235 (one for every 435 people), followed by West Virginia (.0023) and South Dakota with (0.0023). The tenth highest is Oklahoma with a ratio of .0017 (one church for every 588 people) and the twentieth highest is Alaska with a ratio of .0014.

Appendix U is a map that shows the number of congregations by state and by county for the year 2000. Lighter shaded areas have fewer congregations; darker areas

[2] Data in Appendix T was originally obtained for the forthcoming book "No Building Left Behind: New Uses for America's Churches and Schools" by Robert A. Simons, Larry Ledebur and Gary DeWine Washington D.C.: Urban Land Institute).

have more congregations[3].

*2.1.3 Advantages of Adaptive Reuse*

As with gentrification, the process of adaptive reuse brings in new residents and commercial tenants, generates additional economic activity, and results in either renovation or development of the surrounding infrastructure. The conversion of underused historic buildings into functional properties increases the city's tax base and may spur additional investment in the area (Zielenbach, 2000).

The developer of a former religious building for adaptive reuse could be a private development company seeking a return on investment, a nonprofit agency acting as developer for altruistic reasons (such as preservation of an historic structure), a public agency seeking to expand its tax base or abate a nuisance, or a sole proprietor or speculator considering an investment. In some situations, several of these groups may collaborate to achieve their respective goals (Simons, Dimit and DeWine, Forthcoming). This section addresses advantages of adaptive reuse of historic properties, including not only the project costs but also the public side motives, such as urban sustainability and revitalization, historic preservation, and providing low income housing in the distressed areas.

[3] The map is also from the forthcoming ULI book, "No Building Left Behind: New Uses for America's Churches and Schools."

*2.1.3.1 Construction Costs*

Historic buildings are often cheaper to convert to new uses than new buildings cost to build, so the decision to reuse can be made on sound economic grounds (Latham, 2000). In other words, real estate developers are the main recipients of reuse project benefits through savings of construction time and cost. Rehabilitation projects can be done more quickly than new construction unless extensive structural reconstruction is required (Langston, Wong, Hui & Shen, 2008; Gorgolewski, 2008; Simons, Dimit and DeWine, Forthcoming). The shorter development period reduces the cost of financing and inflation of construction costs during the project. Accountants, consultants, architects, lawyers, and other professionals all expect to be paid, usually by the hour, which means that maintaining priorities and tasks on time and on budget is important (Simons, Zitiello and DeWine, Forthcoming). Furthermore, organizations that do not have to relocate experience less disruption to operations and cash flows, as well as reduced temporary accommodation expenses (Langston, Wong, Hui & Shen, 2008). As Langston, Wong, Hui and Shen (2008) noted, the cost of converting a building is generally less than new construction because many of the building elements already exist; given there are no expensive problems to overcome, like asbestos removal or foundation subsidence, the reuse of structural elements is a significant savings.

Simons, Dimit and DeWine (Forthcoming) compared hypothetical development costs of a condo conversion project of a church to a new construction project with the same price points. They found that the total development cost for the new project is

approximately 6.5% higher that rehabilitation project. They concluded that in most situations an adaptive reuse rehab project can be brought to market at less expense than comparable new construction. There can be more unexpected costs with rehab but fewer additional investment dollars after site acquisition, making the deal attractive to some developers if the project is "bought right," especially in cost-sensitive, depressed markets.

*2.1.3.2 Urban Sustainability*

There is growing support that adaptive reuse of historic structures satisfies a key concept of sustainability (Bullen and Love, 2009). Adaptive reuse is an efficient "green" approach that protects environments and increases sustainability in urban areas. Although the amount of energy consumed during a building's lifetime varies greatly from building to building, extending a buildings' useful life is almost always more sustainable than demolishing and reconstruction (Rabun and Kelso, 2009). Environmental benefits from adaptive reuse arise through the recycling of materials, reuse of structural elements, and the reduction in generated landfill. These benefits translate into cost advantages to the developer or the owner in addition to the wider environmental considerations (Langston, Wong, Hui & Shen, 2008; Bullen and Love, 2009). These wider considerations include: reduced depletion of non-renewable natural resources such as minerals and fossil fuels; reduced air pollution from manufacturing processes and road transportation; protection of natural landscapes; and reduced building

waste deposited to landfill sites.

Conservation of the effort, skill and dedication of the original builders is as much energy conservation as it is heritage conservation. According to Latham (2000), whether buildings are made of low energy consuming materials like stone, or high energy like steel and glass, the constructed building encapsulates that used energy. Demolition dissipates it, mostly to waste, though materials reclaimed by adaptive reuse can go some way to compensating for it (Latham, 2000).

In addition, many adaptive reuse projects are directly related to Brownfield remediation issues in the urban area. While the typical Brownfield site is an industrial property, many other historic uses also leave environmental contamination behind after the property has been abandoned, including fuel service stations, retail establishments such as dry cleaners, and even some residential properties that may have residual lead contaminants (Mallach, 2006). Brownfield redevelopment through adaptive reuse projects is very important because it provides an opportunity for intergovernmental management and mitigation of these sites as well as for community enhancement and improvement (Bacot and O'Dell, 2006). Adaptive reuse projects can also provide a better business environment by upgrading the communication and transportation infrastructure through redevelopment of the Brownfield area.

*2.1.3.3 Historic Preservation*

Urban history is an act of recovery as well as a creative gesture toward the

future – a way to comprehend and build upon places over time. Urban history has gradually made its way onto the radar screens of public officials as a tool to revitalize a distressed urban area (Clark, 2004). From this point of view, community assets such as historic religious buildings, museums and libraries that are concentrated in urban areas make direct contributions to the economy. By enriching the lives of residents and attracting visitors, urban history can exert a powerful, although indirect, influence on private investment (McNulty, Jacobson & Penne, 1986).

Historic preservation is an urban design technique used to protect historic resources in the urban built landscape (Ugochukwu, 2006). Adaptive reuse projects can be strong strategies of historic preservation that provide a positive impact on a local economy (Tyler, 2000). In general, we credit historic preservation by designing historic features into public, commercial, and even residential building projects (Latham, 2000). Latham pointed out that a whole interior design industry has developed around the concept of "historic theming" in museums, shopping centers, restaurants, pubs, night clubs and hotels. He also pointed out that speculative housing developments apparently have greater sales potential if the have a traditional look rather than if they have a modern design (which risks complete rejection). In this sense, historic building reuse projects have been preferred by both private developers and public agencies because existing historic features obviate the need to input such historical characteristics to a new building.

*2.1.3.4 Urban Revitalization*

Zielenbach (2000) pointed out urban revitalization is a function of both local physical characteristics, including geographic location and urban amenities, and human capital. Proximity to highly desirable locales such as historic resources makes certain communities appealing to both individuals and businesses (Zielenbach, 2000). As such, adaptive reuse may be considered a catalyst for neighborhood revitalization and renewal of distressed urban areas by positively stimulating the local economy through job creation. Adaptive reuse projects require less material and fewer natural resources, but they are more labor intensive. Adaptive reuse is a greater employment generator than new construction. According to Latham (2000), adaptive reuse generates 25% more employment than new construction per square meter of floor space as a result of the typical labor intensive activities involved in renovation. The reliance on labor-intensive work is important not only in terms of the employment potential of historic preservation, but also in terms of an individual project's spillover effects on the local economy (Tyler, 2000). In other words, adaptive reuse projects generate economic multiplier impacts. Those impacts include growth in local retail business, growth in commercial real estate development, and growth in ancillary services such as daycare and consumer services because reused properties can provide stimulation for new businesses and residents whose investments might boost the local economy (Simons and Choi, 2010).

Adaptive reuse projects also tend to augment revenues for state and local governments by returning underused buildings to the tax rolls (Latham, 2000; Forrant,

2007). Increased tax revenues then enable local government to invest more funds into the distressed community. The result of such benefits generated by adaptive reuse projects may be seen as additional renovation or development of the surrounding infrastructure (Zielenbach, 2000).

In addition, reused historic buildings can be wonderful sources for tourism and leisure while at the same time adaptation of historic buildings can be visual amenity[4] assets for neighborhoods (Latham, 2000; Wang and Zeng, 2010). That is to say that adaptation and renovation of historic buildings generates tangential non-priced benefits that cannot be economically enumerated to the public. These benefits arise when people get enjoyment and satisfaction from a restored building without paying for access (Garrod, Willis, Bjarnadottir & Cockbain, 1996). As a result, adaptively reused historic buildings are recognized by the federal or the local governments because urban policy makers assume that these buildings have local historic and cultural values (Wang and Zeng, 2010).

*2.1.3.5 Providing Low Income Housing*

Adaptive reuses of historic buildings can act as a catalyst and lubricator to the process of introducing alternative functions into areas otherwise swamped by market competition (Latham, 2000). Historic religious buildings can be reused for residential

[4] Visual amenity is concerned with the subjective enjoyment that a society experiences from its visual environment. It responds to popular taste and is not inhibited by fixed criteria dictating what should or should not be preserved (Latham, 2000).

properties. However, it is very challenging because religious buildings' architectural styles do not allow the developer to create many individual units without additional construction. Furthermore, conversion of religious structures into market rate condominiums can be viewed as demolishing the religious values in the community. If the building features allow the initiator to build rental housing for low income households, however, a reuse of a religious building for low income housing can be preferred by the community. Some religious buildings located in a distressed community may be good candidates for low income housing if the building can house enough units (Simons and Choi, Forthcoming).

The United States government has input considerable funds to subsidizing low income housing, including both *project-based* programs, such as public housing and Section 8 New Construction, and *tenant-based* voucher programs, such as the Section 8 existing housing assistance, that aim to shoulder a portion of the cost of privately provided hosing (Sinai and Waldfogel, 2005). *Project-based* programs are supply side subsidies while *tenant-based* voucher programs are demand side governmental subsidies. The federal low income housing tax credit (LIHTC) is one of the major subsidies to boost economic and social conditions in low income communities. The federal expenditures on low income housing create positive externalities: enhanced home maintenance, social and political participation, and attachment to community. There are also intrinsic, private benefits that all members of society deserve a chance to consume on the grounds of distributive justice (Galster and Santiago, 2008); the benefits accruing

to low income housing are increased wealth, social status, and control over dwelling, pride and life satisfaction.

### *2.2 Determinants of Reuse Projects*

#### *2.2.1 Call Option Theory*

Religious building reuse projects can be viewed as an application of call option theory, where the developer exercises a call option when the time is right for the deal. A call option gives its owner the previously negotiated right to buy an asset at a specific price during a specific period time. The writer or seller of the option has an obligation to deliver the asset if the option is exercised and in return receive the exercise price (Simit and Trigeorgis, 2004). The basic concept of a relationship between a call option theory and adaptive reuse of religious buildings is driven by Fischer Black and Myron Scholes' work on stock option pricing (1973).

Option theory provides deep insight into the investment timing of religious buildings; the theory is useful in explaining when investors should initiate adaptive reuse projects and when they should wait to invest. If potential project initiators assume that a project's market is uncertain, then they will wait and delay the project while watching market conditions. On the other hand, if project initiators assume that a market is not uncertain, and then they can more easily make the decision about whether to purchase the property or not since their decision will be based primarily on property value and not the effects of market conditions. The likelihood and timing of an asset owners'

investment begins with the observation that an owner's decision to invest in a particular market, technology, etc., at a point in time will reflect the presence or absence of different types of options (Reuer and Tong, 2007).

Luehrman (1998) divided investment timing into six stages based on the option approach: invest now, maybe now, probably later, maybe later, probably never, and never. The investment timing is determined by a property's expected rate of return and uncertainty characteristics. A high expected rate of return with lower uncertainty results in "invest now," whereas lower expected rate of return with lower uncertainty results in "invest never".

The option to develop real estate differs in several important ways from put and call options that investors can trade on organized exchanges (Williams, 1991). In terms of real estate development, the owner of real estate assets can select the scale of density at which to develop his/her property. If the costs of carrying an undeveloped property exceed sufficiently its operating revenues, then the owner has an incentive to abandon his property (Williams, 1991). This option is more valuable the more uncertain are changes over time in either operating revenues or construction costs (Williams, 1991). The option approach say that if returns are uncertain, then owners' decisions to develop their real estate assets can be delayed because the delay of development of real estate assets allows gains in information about future returns (Schatzki, 2003). The role of market uncertainty has been appeared in many scholarly articles dealing with the decision for real estate investment, including property (re)development (Williams, 1991;

Lentz and Tse, 1995; Batabyal, 1999; Sing and Patel, 2001; Capozza and Li, 2002), conversion of use (Gunnelin, 2001; Schatzki, 2003; Towe, Nickerson and Bockstael, 2008), and new construction (Fu and Jennen, 2009).

Schatzki (2003) examined the effects of uncertainty of returns and sunk costs on land use conversion decisions by examining agricultural to forest conversion. Using a sample of agricultural plots in the state of Georgia, he found that the conversion threshold increases with greater uncertainty in the returns to either agriculture or forests and that the conversion threshold decreases with greater correlation between changes in returns to agriculture and forests. Based on empirical results of this estimation, Schatzki concluded that actual land owner decision-making incorporates these option values into land conversion decisions and that the magnitude of theses options is potentially large.

Gunnelin (2001) examined how uncertain property values, i.e. the vale in the current use and the value in the new use, and uncertain construction costs affect the optimal timing of a redevelopment project and the value of the redevelopment option. By taking the full uncertainty of the redevelopment problem into consideration, his paper contributes to the understanding of property owners' investment behavior that may otherwise seem paradoxical.

### *2.2.2 Internal Factors*

Internal factors in this dissertation indicate factors related to physical building or property owners. Previous literature has pointed out that a decision to preserve or reuse

an historic building is strongly affected by internal factors including physical building characteristics (Burchell and Listokin, 1981; Mallach; 2006; Wang and Zeng, 2010; Shen and Langston, 2010; Simons and Choi, Forthcoming) and seller's denomination (Simons and Choi, Forthcoming). In addition to these factors, historic designations can affect an initiator's decision to convert the property for a certain purpose because such designation at the national, state or local level may make the property more attractive (Asabere, Hachey and Grubaugh, 1989; Asabere, Huffman and Mehdian, 1994).

Physical building styles and characteristics play a pivotal role in initiators' decision for reuse outcomes of historic building reuse projects. Initiators of reuse projects seek more unusual buildings to convert, such as historic religious buildings. Wang and Zeng (2010) pointed out that the requirements of the local building codes and the zoning allow or potentially allow affect the proposed uses based on the structural stability of the building and the condition of the mechanical systems should be evaluated when initiators decide their projects. Although a religious building has a sense of historic linkage to the community, if the building style and condition does not fit for a particular reuse outcome or the building condition is too deteriorated to reuse building components without a serious investment, the initiator may delay the building reuse project until they can finance the project with more subsidies. Alternatively they may give up the project, meaning call option is not exercised.

Burchell and Listokin (1981) posited that the condition of the property and building features should be considered in the decision making process of selecting a

reuse outcome. According to their study, residential conversion is the best outcome for a building in good condition and attractive architectural features under both weakening and strengthening markets, but is not a good alternative for a building in poor condition under either weakening or strengthening market. In the case of poor building conditions with common architectural style, they recommended public spaces as a good redevelopment outcome. Mallach (2006) mentioned that if a building is attractive, of high quality, or of architectural or historic value, the building is worthy of being preserved and converted into new uses. Focusing on residential conversion, Mallach argued the size of a building always matters when selecting a reuse outcome, but the architectural or historic quality of the building, character of the building relative to potential market demand, and presence of environmental concerns are also important factors to be considered when developers decide project outcomes. Similarly, Lion (1982) stated that before any decisions are finalized on the extent or the nature of building reuse, it is essential to perform a complete and thorough building inspection to determine the state of health or deterioration of the building and what repairs, if any, have to be done apart from other alterations for adaptation to other uses.

Shen and Langston (2010) focused on the physical life of historic buildings as an important ingredient in the necessary adaptation of the constructed environment due to the impact of climate change and the need to conserve valuable resources in the future. They evaluated adaptive reuse potential (ARP) of 64 historic buildings completed in either Hong Kong or Australia. Through their own application of ARP, mean values are

determined for a number of variables that suggest that the model relates equally well to different contexts. For ARP evaluation, they used date of original construction, date of subsequent major refurbishment, and forecast of physical life to evaluate adaptive reuse potential of historic buildings. A building's physical condition played a core role in their calculation and analysis.

The adaptive reuse decision might be affected by a seller's organizational features. For example, whether or not a seller has a hierarchical organization would impact an initiator's decision because some outcomes might be preferred by a hierarchical seller. For example, the Catholic church has a hierarchical decision making process and their policies, such as promulgating the merger or relocation plans for their parishes, may have driven a larger, but more controlled and economically efficient, net loss of religious buildings, compared with denominations which do not follow a centralized hierarchical process (Simons and Choi, Forthcoming).

Architectural and historic evaluations must also be made. Want and Zeng (2010) stated that whether or not the building can meet the criteria of the national register, how much of the historic fabric exists – the authentic materials and workmanship that give the building its character or integrity – and how much it is feasible to preserve can be considered at the decision phases. The easiest way to evaluate religious buildings' historic value is to investigate whether or not potential religious buildings reuse projects are registered at a national historic landmark or located in a national historic district. Many religious buildings are directly connected to cultural identities in neighborhood

not only because they have provided cultural events but also because with intangible factors they are historic and old, and they have played an important role in architectural design and landscape of the community. Therefore many historic buildings have been designated as national historic places.

Historic places can be designated at the national, state, and local level. Historic designations give owners of historic places an advantage in the competitive process of grant application and create an identifiable voice in community affairs. Although historic designations restrict development opportunities of owners, they also make historic buildings more attractive to future tenants. Under this assumption, potential initiators of reuse projects of religious buildings might seek properties designated as historic places.

The National Trust for Historic Preservation is the most prominent preservation organization in the United States. The initial focus of the trust involved the acquisition of important historic properties. The trust acquired many other buildings and sites during its early years (Benson and Klein, 2008); however, its vision soon expanded to embrace the broader goals of public education and assistance to local organizations and projects (Benson and Klein, 2008). In addition, there are state-wide organizations, such as Preservation North Carolina and Historic Landmark Foundation of Indiana. Some nonprofit organizations such as the Cleveland Restoration Society began as grassroots efforts without any special assistance from statewide groups. They became regional leaders over in an extended period of time (Benson and Klein, 2008).

The National Register of Historic Places is the Nation's official list of cultural

resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources. Properties listed in the Register include districts, sites, buildings, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the National Park Service, a part of the U.S. Department of the Interior (National Park Service, 2010).

The relationship between historic preservation and nearby housing values has been analyzed by various academic fields using hedonic regression models; although there has been evidence of a negative impact or no impact of historic preservation through historic landmark or district designation on nearby housing values in several studies (Asabere, Hachey and Grubaugh, 1989; Asabere, Huffman and Mehdian, 1994), a positive relationship predominates in research cases (Ford, 1979; Coulson and Leichenko, 2001; Noonan, 2007; Narwold, 2008).

Historic preservation is an urban design technique used to protect historic resources in the urban built landscape (Ugochukwu, 2006). Historic preservation adds value to the existing built environment just as conservation adds to the natural landscape (Benson and Klein, 2008). Stimulating historic preservation work is not limited to the voluntary civic activist: well-educated and ambitious leaders in this growing enterprise can find opportunities in all three major economic sectors: nonprofit organizations, government agencies, and private businesses (Benson and Klein, 2008).

*2.2.3 External Factors*

Location characteristics (Farrell, 1979; Luther, 1988; Murtagh, 2005; Wang and Zeng, 2010), demographic shifts (Mian, 2008; Wang and Zeng, 2010; Simons and Choi, Forthcoming), local commercial market conditions (Williams, 1991; Lentz and Tse, 1995; Luehrman, 1998; Batabyal, 1999; Sing and Patel, 2001; Capozza and Li, 2002; Gunnelin, 2001; Schatzki, 2003; Towe, Nickerson and Bockstael, 2008) and macro-economic trends (Simons and Choi, Forthcoming) are important external factors that affect initiators' decisions to reuse historic buildings.

Location factors that affect developers' decision to invest can be divided into the highest levels, state or Metropolitan Statistical Area (MSA) level, nearby neighborhood level (urban, suburban or exurban), and micro-location of amenities (Kiel and Zabel, 2008). State level geographic division is a proxy of difference in not only climate, proximity to bodies of water, and cultural attractions, but also state regulation or incentive policies. Neighborhood level geographic division is a proxy of difference in zoning allowance and development potential in terms of surrounding infrastructure. Micro location of urban amenities may include proximity to a park, lake, river, highway, airport, etc. These urban amenities are very important considerations when developers invest their money. Urban amenities are positively or negatively related to residential preference and housing prices. Benson, Hansen, Schwartz and Smersh (1998) estimated the value of the "view" amenity in single-family residential real state markets. Their work focused on Bellingham, WA – a city with a variety of views, including oceans,

lakes, and mountains – and allowed for differentiation of the view amenity by both type and quality. They found that depending on the particular view, willingness to pay for this amenity may be quite high. Simons and Choi (Forthcoming) tested whether or not location variables affect outcomes of reuse projects. Their findings support previous literature that has empirically proven the negative impacts of the proximity of highways (Clay and Smidt, 2004; Bourassa, 2006) and airports (McMillen, 2004; Jud and Winkler, 2006; Pope, 2008; Cohen and Coughlin, 2008) on residential projects. They also concluded that those location features, however, provide advantages to retail shops as they generate high traffic volume.

One of the key determinants for adaption of abandoned or underused buildings is demographic component shifts. For instance, according to Wang and Zeng (2010), whether or not a need exists for the proposed reuse can be a product of the local social and demographic characteristics of the area and affect its feasibility. In addition, the type of development taking place locally, the competition in the market, what other uses exist in the area, what proximal plans are in place, and the existing or potential environmental quality of the surrounding areas should be evaluated when initiators decide outcomes of reuse projects.

Macro economic trends such as interest rates, housing starts and employment growth should be considered when the initiator wants to redevelop religious buildings. Simons and Choi (Forthcoming) found effects of macro economic conditions and reuse choices. If reuse plans are for-profit projects, macro economic conditions have a more

direct influence on the critical aspects of a project, such as its investment, cost, profit, time, marketing value, etc (Ren and Lin, 1996). Unemployment rate is negatively related to new constructions (Iden, 1972; Perloff, 1981; McGinnis, 1994; Liu and Shen, 2005).

### *2.2.4 Tax Credits*

Not all adaptive reuse projects of religious buildings are profitable without the benefit of public subsidies. As Saurwein and Simons (Forthcoming) stated, communities may find nonfinancial value in saving old buildings that are important to the community because they are highly visible landmarks or otherwise provide an amenity to the neighborhood. Often these projects are developed by nonprofit or public agencies financed with heavy public subsidies and little expectation of financial returns. Developers also tend to rely heavily on debt financing and, accordingly, projects need to produce enough positive cash flow to cover expenses and debt service. Most importantly, a developer needs to be sure that he or she will receive some profit from the project, or else the project will not justify the amount of work required to make the project move forward (Saurwein and Simons, Forthcoming).

Among the variety of social and economic factors that have contributed to the current interest in rehabilitation, the most important have probably been the federal income tax credits for the rehabilitation of historic and old buildings (Kass, LaBelle and Hansell, 1993; Saurwein and Simons, Forthcoming). Adaptive reuse projects of historic religious buildings complexities usually can be managed using both conventional and

creative real estate development practices (Saurwein and Simons, Forthcoming); despite their potential for increased costs and risks, historic churches are often ideal opportunities for using creative financing tools, such as historic preservation tax credits and nonprofit grants.

Rhodes and Wilkinson (2006) also pointed out the role of financial incentives in choice of property conversion decisions of stakeholders. Tax credit is a dollar-for-dollar recognition of payment of taxes due. Tax credits function either as a reduction in the amount of taxes owed or, if they are *refundable tax credits*, as a dollar-for-dollar payment made by the government directly to the taxpayer through the tax system (Saurwein and Simons, Forthcoming). Kass, LaBelle and Hansell (1993) noted two federal income tax credits that apply for rehabilitation of historic buildings: the historic preservation tax credit (HPTC) and the low income housing tax credit (LIHTC). Saurwein and Simons (Forthcoming) added the new market tax credit (NMTC) to the options available in decisions. Their study assumes that initiators of adaptive reuse projects of religious buildings have used these three types of tax credits according to the purpose of projects.

#### *2.2.4.1 The Historic Preservation Tax Credit (HPTC)*

The federal HPTC is one of the most successful and cost-effective public and private revitalization incentive programs in the United States. The program is administered by the National Park Service and the Internal Revenue Service (IRS) in

partnership with State Historic Preservation Offices. The HPTC program provides federal income-tax incentives for the rehabilitation of historic income-producing properties. Rehabilitation includes renovation, restoration, and reconstruction but it does not include enlargement or new construction (IRS, 2010). Therefore, it may apply for adaptive reuse projects if reuse project initiators do not add new constructed buildings to existing sites.

The HPTC is equal to either 20% or 10% of the amount of qualified rehabilitation expenditures. Whether developers can get benefits from a 20% or 10% rehabilitation tax credit is dependent upon various criteria established by the federal government (National Trust Community Investment Corporation, 2010). The owner must hold the building for five full years after completing the rehabilitation or pay back the credit. If the owner disposes of the building within a year after it is placed in service, 100% of the credit is recaptured by the government (National Park Service, 2010).

To be eligible, a property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment; the historic character of a property shall be retained and preserved; most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved; deteriorated historic features shall be repaired rather than replaced; chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used; significant archeological resources affected by a project shall be protected and preserved; and new

additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired (National Park Service, 2010).

*2.2.4.2 The Low Income Housing Tax Credit (LIHTC)*

The LIHTC program is administered by U.S. Department of Housing and Urban Development (HUD). The LIHTC is an indirect federal subsidy used to finance the development of affordable rental housing for low-income households. Most new construction and substantial rehabilitation projects are eligible for a nine percent tax credit, meaning that owners receive a credit equal to nine percent of the qualified costs each year for 10 years. Projects that are financed through the issuance of tax-exempt bonds may qualify for an automatic four percent tax credit program (IRS, 2010).

At least 20% of the units in the project must have rents affordable to low incomes and must be occupied by households with incomes no greater than 50% of the median. Alternatively, at least 40% o the units must be affordable and occupied by families with incomes no greater than 60% of median to qualify for the credit (National Association of Housing and Redevelopment Officials, 2010). According to IRS rules, low-income occupancy must be maintained for at least 15 years, but there are very strong federal incentives to maintain the restrictions for 30 years and some states impose additional requirements (National Association of Housing and Redevelopment Officials, 2010).

The Low Income Housing Tax Credit (LIHTC or Tax Credit) program was created by the Tax Reform Act of 1986 as an alternate method of funding housing for low- and moderate-income households, and has been in operation since 1987. Until 2000, each state received a tax credit of $1.25 per person that it can allocate towards funding housing that meets program guidelines (currently, legislation is pending to increase this per capita allocation). This per capital allocation was raised to $1.50 in 2001, to $1.75 in 2002, and adjusted for inflation beginning in 2003. These tax credits are then used to leverage private capital into new construction or acquisition and rehabilitation of affordable housing.

*2.2.4.3 The New Market Tax Credit (NMTC)*

The NMTC is administered by the Community Development Financial Institution (CDFI) Fund under the U.S. Department of the Treasury. Part of the Community Renewal Tax Relief Act of 2000, the New Markets Tax Credit Program will spur approximately $15 billion in investments into privately managed investment institutions. In turn, these privately managed investment institutions, or Community Development Entities (CDEs), will make loans and capital investments in businesses in underserved areas. By making an investment in a CDE, an individual or corporate investor can receive a tax credit worth 39 percent (30 percent net of present value) of the initial investment distributed over 7 years, along with any anticipated return on their investment in the CDE.

The NMTC program is similar to the LIHTC credit program in that both target low-income areas. However, while the LIHTC program is limited to financing rental housing, the NMTC program is much broader in scope and focuses on nonresidential economic development activities to assist local businesses (Saurwein and Simons, 2009). It permits individual and corporate taxpayers to receive a credit against federal income taxes for making qualified equity investments in designated Community Development Entities (U.S. Department of Treasury, 2010). The NMTC Program permits taxpayers to claim a credit against Federal income taxes for Qualified Equity Investments (QEIs) made to acquire stock or a capital interest in designated Community Development Entities. These designated CDEs must use substantially all (defined as 85 percent) of these proceeds to make Qualified Low-Income Community Investments (QLICIs).

*2.3 Summary of Chapter II*

The first part of Chapter II addressed background information that is useful to understand for, private developers, and the public agencies who want to generate more benefits or preserve religious buildings through adaptive reuse projects. The concept and definition of adaptive reuse, reasons for redundant religious buildings, and advantages of adaptive reuse projects compared to new constructions were described. In addition, this chapter included definitions of associated terms to adaptive reuse, such as preservation, restoration and reconstruction.

The later part of Chapter II examined the factors that might affect initiators'

decisions for religious building reuse projects. Table 2-3 summarizes the relationships between each outcome and the variables. The size of properties, including building size and lot size, has a positive effect to residential reuse plans but is negative to commercial reuses. In addition, residential reuse projects may need more building stories than commercial plans to allow the developer to build more residential units. Simons and Choi (Forthcoming) found that the seller's hierarchical denomination is positively related to low income housing as a reuse outcome. Main streets and corner locations are positively related to retail places as a reuse outcome; this seems reasonable because those locations generate high traffic volume which is positively related to retail spaces but negatively related to residential properties. Higher income level is always welcome to the for-profit developers, but it was negatively related to rental housing as a reuse outcome. It seems that if religious buildings are located in distressed neighborhoods, such religious buildings tend to be redeveloped by non-profit or governmental agencies for low income housing.

Availability of tax credits are enforced by federal laws. To utilize the federal preservation tax credit[5], users must hold properties at least five years. Therefore, the historic preservation tax credits are not appropriate for for-sale housing projects. To utilize the low income housing tax credit[6], users must hold low income housing at least 15 years. Therefore the low income housing is positive to low income housing as a reuse

[5] The federal historic preservation tax credit is based on Section 48 and Section 170 of the Internal Revenue Code of 1986 (National Park Service, 2010)
[6] The LIHTC is based on Section 42 of the Internal Revenue Code, enacted in 1986 and made permanent in 1993 (National Association of Housing and Redevelopment Officials, 2010).

outcome, but negative to all other outcomes. In order to utilize the new market tax credit[7], end uses must be income generating uses except housing projects. Therefore the new market tax credit is negative to residential projects.

*2.4 Limitations of Previous Literature*

There are three aspects of the relationship of reuse projects to external variables that are not adequately addressed in the previous literature. First, historic designations that might be positively associated with reuse choices have not been statistically tested by previous studies that use historic designations as proxies of historic and architectural values of religious buildings. Such testing would inform whether historic district designations and sacred landmarks give our neighborhood an advantage in the competitive process of grand applications and create identifiable voice in community affairs.

Second, the effects of commercial real estate market conditions on historic building reuse choices have not been statistically investigated. Previous studies of the call option theory have revealed a market impact on land conversion or development, however, the impact of market volatility or conditions on historic building reuse plans was not statistically tested.

Finally, relationships between reuse choices and public subsidies, including the

[7] The new market tax credit is a part of the Community Development Financial Institutions Fund (the CDFI Fund). The CDFI Fund was established by the Riegle Community Development and Regulatory Improvement Act of 1994, as a bipartisan initiative (U.S. Department of the Treasury, 2010).

historic preservation tax credit, the low income housing tax credit and the new market tax credit, were not statistically tested by previous studies, even if such credits have played an important role in gap financing for both private developers and public agencies who initiated reuse projects of historic buildings (according to their own accounts of the projects). Therefore, these three factors – the historic designation, commercial market conditions and tax credits – are considered as primary independent variables.

Table 2-3 Summary of Literature

| Factors | Authors | Condominium | Apartment | Retail | Office |
|---|---|---|---|---|---|
| Building Characteristics | Burchell and Listokin (1981); Lion (1982); Mallach (2006); Shen and Lanston (2010); Wang and Zeng (2010); Simons and Choi (Forthcoming) | Building Size (+)<br>Lot Size (+)<br>Story (+)<br>Age (–)<br>Brick (+) | Building Size (+)<br>Lot Size (+)<br>Story (+) | Building Size (–)<br>Lot Size (–)<br>Story (–) | Building Size (+)<br>Lot Size (+)<br>Story (–)<br>Age (–) |
| Seller's Denomination | Mian (2008); Simons and Choi (Forthcoming) | Hierarchical (–) | Hierarchical (+) | Hierarchical (–) | Hierarchical (–) |
| Historic Designation | Ugochukwu (2006); Benson and Klein, (2008) | Unknown | Unknown | Unknown | Unknown |
| Location Characteristics | Farrell (1979); Luther (1988); Murtagh (2005); Wang and Zeng (2010); Simons and Choi (Forthcoming) | Main Street (–)<br>Highway (–)<br>Park (+)<br>Corner (–)<br>MA (+)<br>NY (+)<br>TX (+) | Main Street (–)<br>Highway (-)<br>Park (+)<br>Corner (-)<br>MA (n)<br>NY (-)<br>TX (–) | Main Street (+)<br>Central City (+)<br>Highway (+)<br>Park (-)<br>Corner (+)<br>MA (-)<br>TX (-) | Main Street (-)<br>Central City (+)<br>Highway (+)<br>Park (-)<br>Corner (+)<br>MA (-)<br>TX (-) |
| Demographic Shift | Mian (2008); Wang and Zeng (2010)Simons and Choi (Forthcoming) | Income (+)<br>White (+) | Income (–)<br>Vacancy (+)<br>Income (–) | Income (+)<br>Young (-)<br>Rent (–) | Income (+) |
| Local commercial market Condition | Williams (1991); Lentz and Tse (1995); Luehrman (1998); Batabyal (1999); Sing and Patel (2001); Capozza and Li (2002); Gunnelin (2001); Schatzki (2003); Towe, Nickerson and Bockstael (2008) | | | Retail occupancy rate (+) | Office occupancy rate (–) |

| Factors | Authors | Condominium | Apartment | Retail | Office |
|---|---|---|---|---|---|
| Macro Economic Condition | Kiel and Zable (2008); Mian (2008); Simons and Choi (Forthcoming) | Employment Rate (+) | Employment Rate (+) | Employment Rate (+) | Employment Rate (+) |
| Historic Preservation Tax Credit | Kass, LaBelle and Hansell (1993); Saurwein and Simons (Forthcoming) | HPTC (–) | HPTC (+) | HPTC (+) | HPTC (+) |
| Low Income Housing Tax Credit | Kass, LaBelle and Hansell (1993); Saurwein and Simons (Forthcoming) | LIHTC (–) | LIHTC (+) | LIHTC (–) | LIHTC (–) |
| New Market Tax Credit | Saurwein and Simons (Forthcoming) | NMTC (–) | NMTC (–) | NMTC (+) | NMTC (+) |

Note: + denotes a positive relationship between an outcome and a variable

# CHAPTER III

## CASE STUDIES

Chapter II discussed previous literature and its limitations. Chapter III presents five religious building reuse cases in light of market conditions, historic values, architectural significances, and uses of public subsidies such as tax credits. The purpose of the multiple-case study is not to test hypotheses of this dissertation but to explore important factors that have been associated with initiators' decision to invest their capital. Chapter III with Chapter II provides determinants to be analyzed in this dissertation.

Five religious buildings that have been reused for different purposes are considered: the Meridian Street Methodist Episcopal Church in Indianapolis, IN; the Notre Dame Academy in Cleveland, OH; the Ashbury Delaware Methodist Church in Buffalo, NY; the First Church of Christ Scientist in Cleveland, OH; and the Orthodox Jewish Congregation – Cheva Bikur Cholim in Seattle, WA. In-depth interviews with

developers were used to determine the important factors that drove their investments in the reuse projects. Appendix A shows an interview guide for the case studies.

*3.1 Case Selection Strategies*

In this dissertation, three particular criteria have been considered to select cases of religious building reuse projects in the United States: the representativeness of the reuse outcome, regional considerations, and religious denomination. Five cases are presented with various outcomes (Table 3-1). For the Western region of the US, the Orthodox Jewish Congregation Chevra Bikur Cholim in Seattle, Washington was selected as a case study. The church building has been reused as the Langston Hughes Performing Arts Center since 1971. In the Midwest region, the reuse project of the Meridian Street Methodist Episcopal Church in Indianapolis, Indiana was selected. This church building has been reused for market rate condominiums with the marketing name "Oxford House." Another case in the Midwest region is the reuse project of the First Church of Scientist in Cleveland, Ohio. The church building has been reused as offices of Nottingham-Spirk, an innovative design company. A third case from the Midwest region is the reuse project of the Notre Dame Academy in Cleveland, Ohio. The church building has been reused for low income and elderly housing. In the Eastern region of the US, the Ashbury Methodist Church in Buffalo, New York was selected as a case. The religious building has been reused for Babeville, a commercial complex featuring a concert hall, art gallery and recording studios.

Table 3-1 Case studies of Reuse Projects of Religious Buildings

| Church Name | Denomination | State | Outcome | Tax Credit |
|---|---|---|---|---|
| The Meridian Street Methodist Episcopal Church | Methodist | IN | Condominium | NA |
| The Notre Dame Academy | Catholic | OH | Apartment | LIHC; HPTC |
| Ashbury Methodist Church | Methodist | NY | Retail | NMTC; HPTC |
| First Church of Christ Scientist, Cleveland | Christ Scientist | OH | Office | NMTC |
| The Orthodox Jewish congregation, Chevra Bikur Cholim | Jewish | WA | Cultural | NA |

*3.2 Condominium: Meridian Street Methodist Episcopal Church in Indianapolis, IN*

*3.2.1 The Concept of the Project*

The Meridian Street Methodist Episcopal Church located on Meridian Street, in Indianapolis, Indiana has been reused for market rate condominiums. The historic church building was converted into 27 unique condominium units and another building was newly constructed. The condominiums are known by their marketing name, “Meridian Arch”.

The site was adapted by Hearthview Residential (www.hearthview.com), a local developer in Indianapolis, Indiana who has pioneered transforming notable historic buildings into luxury condominiums in downtown Indianapolis. Browning Day Mullins Dierdorf Architects participated for this church reuse project as the architect. Although their initial plans called in demolishing the church, community activists and the Indianapolis Historic Preservation Commission quickly had the building placed on Historic Individual Property status (Adaptive Reuse Info, 2010). As a result, the building

was preserved and the reuse project was undertaken. The project was completed in 2007. Hearthview Residential development partner Kelli Lawrence said “our buyers range from young, first time homeowners to families to well established empty nesters (Lawrence, 2010).”

Appendix B shows location of the Meridian Street Methodist Episcopal Church in Indianapolis, Indiana. Respecting the building’s place and effect within the area’s social fabric, the new residences easily mix within the neighborhood. It is located on Meridian Street just eight blocks north of Monument Circle and adjacent to the Veterans Memorial Plaza and new downtown Central Library.

Appendix C shows a bird’s eye view of the property. The original church building has four stories. The original church building was built with Indiana limestone in the distinctive French Gothic architectural style. Units are priced from the $180,000’s to the $990,000 (Hearthview Residential, 2010).

The project consists of two buildings: the original historic church and entirely new construction portion. The owner and architect have worked closely with the Indiana Historic Preservation Commission to overcome the difficulties of the conversion of the church by preserving what is essential to its history and while providing what is necessary for the future. The majority of the existing church was demolished – the sanctuary was the only part of the original church retained. The sanctuary’s detailed interior vaults, medallions and other plasterwork became features in the new condominium homes (Lawrence, 2010). The demolished portion of the building was replaced with new construction designed to complement and “complement-by-contrast” the remaining turrets and sanctuary walls in scale, rhythm and material. The new

building has a contemporary corner turret with an exposed, open steel frame top (Lawrence, 2010). The open new turret acts as an architectural reference for the removal of the existing church's turret steeples. There are a total of 75 condominiums in the project spread over four levels of the building with two additional levels of indoor parking; one at grade and one below grade (Browning Day Mullins Dierdorf Architects, 2010).

### *3.2.2 Site History*

Meridian Street Methodist traces its origins to Indianapolis' first Methodist population established in 1821. Originally meeting in a log cabin on what is now the state house grounds, the congregation eventually moved to the southwest quadrant of Monument Circle. The building at St. Clair and Meridian Streets was designed by the firm D.A. Bohlen & Sons in 1906. The church was completed in 1906 using Indiana limestone in the style of French Gothic architecture. At that time, the front of the church had two large spires on either front corner. This Gothic Revival style church, built over two years time, served the Meridian Street Methodist Episcopal Church until the early 1950s when the congregation moved to its current facility at 55th and Meridian Streets (The Polis Center, 2010). Indiana Business College then took over the site in 1947 and added offices and classrooms. By late 2002, the college determined they had outgrown the space and moved to a larger location in 2003, on East Washington Street (Hearthview, 2010).

*3.2.3 Market Conditions*

The estimated population in Indianapolis in 2008 was approximately 790,000, growing by 2.1% since 2000. The racial composition in Indianapolis is 67.5% White Non-Hispanic and 25.5% African American. Estimated median household income in 2008 was $43,652, approximately 10% lower than the median household income in the state of Indiana. Estimated median house or condominium value in 2008 in Indianapolis was $125,500 – the same as the estimated median house or condo value in 2008 for the state (City-data.com).

Appendix D shows the trend of building permits for new houses. It has sharply decreased over the last decade; 4,765 residential houses were built in 2001 while only 734 houses were built in 2008.

Appendix E shows the trend of average cost per residential unit. Unlike the trend for the number of building permits, average costs to build a house have remained relatively flat over the same period.

*3.2.4 Issues on Project Financing*

The project is 100% private and there was no public money involved. According to development partner Kelli Lawrence[8], while the project was successful from an architectural and preservation standpoint, it has not been as successful financially. She said that much of that is due to the market in general; however, the higher costs associated with the reuse of the church were also a significant factor (Lawrence, 2010).

[8] Prior to joining Hearthview, Ms. Lawrence served as the Long Range Planner for the City of Carmel, Indiana, working on special planning districts, corridor and neighborhood plans, thoroughfare planning, and redevelopment issues.

*3.2.5 Lessons Learned*

Conversion of the Meridian Street Methodist Episcopal Church in Indianapolis, Indiana into luxury condominiums was completed in 2007. The leading developer was Hearthview Residential and a leading architect was Browning Day Mullins Dierdorf Architects. The original church building now provides 27 luxury condominium units and the new construction provides 48 residential condo units. In terms of project financing, the project was totally private deal.

There are several lessons learned from this project. The historic designation played a pivotal role to preserve this historic church building and initiate a reuse plan rather than demolish the building. The church building has received attention from the general public not only because of its architectural significance, but also due to its role in the history of Indianapolis and central location. This historic building served as both a religious and an educational institution, providing the citizens of Marion County with a space to worship and a place to learn. When new construction was planned, community activists and the Indianapolis Historic Preservation Commission quickly had the building placed on the Historic Individual Property list (Adaptive Reuse Info, 2010), encouraging the developer to preserve this historic building. The project was very successful in terms of preserving historic values and architectural significance; most of the exterior details of the building were retained. The reuse project has not been as successful from a financial standpoint. Much of the underperformance is due to the general market conditions; however, the costs associated with the reuse project were also a significant factor. This project is an example that tells an importance of public and private partnership.

*3.3 Low Income Housing: the Notre Dame Academy in Cleveland, OH*

*3.3.1 The Concept of the Project*

Originally built in 1915, the Norte Dame Academy in Cleveland, Ohio was converted into a mix of low income and elderly-citizen housing. The Famicos Foundation, a non-profit organization that provides housing to Cleveland families, initiated this building conversion project in 1999. The building contains 21 low-income housing units on the first floor and 52 units of low-income elderly housing on upper floors along with health and child care services offices. This building previously housed the worship space as well as a school for girls prior to the reuse conversion. In addition to providing affordable housing units, Famicos completed construction of a Community Service Center on the ground floor of the Academy in 2002 (National Trust, 2010).

Appendix F shows the location of the property. The Academy is located on the intersection of Ansel Road and Superior Avenue on the east side of Cleveland, Ohio. The building is surrounded by low income neighborhoods, such as Glenville, Hough and the St. Clair-Superior area.

Appendix G shows a bird's eye view of the property. The original building is 103,000 square feet constructed with traditional red-brick. The site has plenty of parking spaces. This historic building has been listed on the National Register of Historic Places since 1988. Since its conversion was completed, this place has played a unique role in the history of the city of Cleveland, the Archdiocese and the lives of many Catholic women.

*3.3.2 Site History*

Built in 1915 to school Catholic girls and the worship place, the academy's architecture was designed to match the style of nearby Rockefeller Park. Due to lack of investment, suburban flight, and rising poverty in the area, the school and the church property closed in 1964 and thereafter rapidly deteriorated. It was sold by the Sisters of Notre Dame to the Cleveland Board of Education, operating as the Lulu Diehl Junior High School, and was then subsequently abandoned in 1978 (National Trust, 2010).

The city tried many times to attract investors, but it wasn't until the late 1990s that the Famicos Foundation stepped in and began a restoration that not only brought the academy back to life as affordable senior housing but also fueled a powerful neighborhood rebirth. In the mid-1990s the former school and worship place became part of the Rockefeller Park Neighborhood Revitalization Strategy for conversion into homes for independent senior citizens. The building now stands as an important symbol of a past era while serving some of the neediest residents in Cleveland. Due to the ambitious and tenacious efforts the Famicos Foundation, the Notre Dame Academy building was converted to 73 low-income independent living senior apartments with a fully restored exterior (National Trust, 2010).

By the time the project was completed in 1999, twelve of the houses across the street had also undergone their own renovation and upgrades. Turning an abandoned building into a renovated apartment building has cemented the neighborhood's stability by offering affordable, high-quality living units. With the dedication of the Famicos Foundation and neighbors in the area, housing prices are improving and businesses are reinvesting in the area (National Trust, 2010).

*3.3.3 Market Conditions*

The estimated population in Cleveland, OH 2008 was 433,748, a 9.3% decline since 2000. The racial composition is dominated by 51% African American of the population, and White Non-Hispanic (38.8%). Estimated median household income in 2008 was $26,731 – a much lower figure than the median household income in the state of Ohio ($47,988). Condo and home values in Cleveland were also low in comparison to values of the state of Ohio; estimated median house or condo value was $87,600 in Cleveland was $87,600, while the value in Ohio was $140,200 for 2008 (city-data.com)

Appendix H shows a trend of the number of residential building permits since 1996. The number of building permits has sharply decreased since 2004 when the peak was 374 building permits to a low of only 109 building permits in 2008. On the other hand, Appendix I show that the average cost to build a house has remained relatively flat for the same time period.

*3.3.4 Financing Issues*

The primary funding for the $9.7 million project came from HUD 202 Supportive Housing program funds, Historic Tax Credits through the National Equity Fund, Low Income Housing Tax Credits, and monies from a weatherization grant. Even though additional investment funds were contributed from the City of Cleveland Housing Trust Fund, the project still had a $1.5 million gap to cover for total construction costs. Showing their dedication to the project, the Famicos Foundation pledged its own endowment to allow the project to continue while they undertook an ambitious capital campaign.

*3.3.5 Lessons Learned*

Conversion of the Notre Dame Academy was a public deal which currently houses 72 low income and elderly units. The project was done in 1999 by Famisco Foundation which is a non-profit organization in Greater Cleveland, Ohio. The original building was used as a girl's school and a church for the Catholic Diocese of Cleveland.

The building is located in a distressed area with high poverty rate and low income ranges. Because of location factors, reuse of the building for low income and elderly housing might be the best option. The property has ample spaces in the building and the lot; these features are good amenities when religious buildings are reused for multi- family housing (Simons and Choi, Forthcoming). The community planners from Famicos Foundation, a CDC serving the Greater Cleveland Area, were involved in the project. They utilized not only the historic preservation tax credit but also the low income housing tax credit. This project shows how public money can have an impact on rehabilitations in distressed communities.

*3.4 Retail Purpose: The Ashbury Delaware Methodist Church in Buffalo, New York*[9]

*3.4.1 The Concept of the Project*

Originally built in 1876, the Ashbury Delaware Methodist Church in Buffalo has been reused for Babeville – a facility that currently has a sound recording studio, the Ashbury concert hall, and retail shops. The church building is comprised of two buildings: the sanctuary, which faces Delaware Avenue; and the parish house facing

[9] This project was studies as a case in a forthcoming ULI book, "No Building Left Behind: New Uses for America's Churches and Schools by Robert A. Simons, Larry Ledebur and Gary DeWine)." The case study was done by Gary DeWine.

Tupper Street (Babeville, 2010). The sanctuary has been refurbished to provide a versatile venue for artistic performances and private functions alike. Asbury Hall, as it is now called, accommodates banquets of up to 300 people, theater seating for 800, or standing room for up to 1,000 guests (Babeville, 2010). The parish house now contains the headquarters of Righteous Babe Records, the gallery, a screening room for Hall walls Contemporary Arts Center, and a small bar/lounge. Appendix J shows location of the site. It is located in the central city of Buffalo, New York and located at the crossroads of three National and Local Historic Districts.

Appendix K shows a bird's eye view of the site. Boasting one of downtown's most recognizable steeples, a magnificent exterior of Medina sandstone, and a roof of Vermont slate, it is the last known surviving example of the work of architect John Selkirk (Babeville, 2010). The site has a plenty of parking spaces and located at the intersection of West Tupper Street and Delaware Avenue, a location suitable for retail purposes.

*3.4.2 Site History*

Buffalo-based architect John Selkirk, known for this work on private residences, businesses, and churches in the thriving young city, started designing the church house in 1871 for what became the Delaware Avenue Methodist Church. Construction was completed in 1876 on the sanctuary building, a Gothic Revival structure typical of its time and notable for its use of side galleries and a system of basement catacombs (Babeville, 2010).

The Delaware Avenue Methodist Church became the Delaware Ashbury

Methodist Church after it merged with a second congregation. This name remained until the church closed in the early 1980s. After it closed, two other Protestant congregations briefly occupied the building. The second of these tenants declared bankruptcy and the church was then left vacant. During these years, pews, original windows, and other fixtures were sold or stolen and the structure fell into disrepair. The City of Buffalo then acquired the title to the church (Babeville, 2010).

During mid 1990s, stones fell from the north tower and façade of the building, causing the city to close the streets and sidewalks surrounding it and the church was slated for demolition. The outcry from community activists, preservationists, and the general public inspired Righteous Babe Records president, Scot Fisher, to launch Citizens to Save the Ashbury Church, a grassroots organization dedicated to preventing the destruction of the church. The group took legal action to stop the demolition and then raised funds allowing the city to begin emergency repairs (Babeville, 2010).

In the late 1990s the building was still vacant and the church continued to deteriorate and faced the threat of demolition once again. Fisher and musician Ani DiFranco approached the city with an offer to purchase the building for use as a concert venue and the offices of their record label, pledging to privately finance the interior renovations, ongoing maintenance and operating costs if the city fulfilled its responsibility to repair the exterior and provide necessary structural repairs (Babeville, 2010). Their offer was accepted and they commissioned a series of historical, engineering, and architectural studies of the project. They began working on renovation plans with local architects and completed the effort in 2005 (Babeville, 2010).

*3.4.3 Market Conditions*

Estimated population in Buffalo, NY 2008 was approximately 270,000, declining 7.4% since 2000. White Non-Hispanic is a dominant race in Buffalo, New York, comprising 51.8% of the total population, followed by African American (37.2%) and Hispanic (7.5%). Estimated median household income in 2008 was $29,973, much lower than the estimated median household income in the state of New York for $56,033. In addition, estimated median house or condo value in 2008 was $67,800, again much lower than the estimated median house or condo value of $318,000 for the state (city-data.com).

Appendix L shows the trend of new house building permits since 1996 in Buffalo. The number of building permits recorded the lowest figure in 2006 with only 9 building permits and the highest recorded permits in 2002 with 123 building permits. Appendix M shows the trend of the average cost to build a house since 1996. It was flat until 2001 before increasing significantly over the next several years.

*3.4.4 Financing Issues*

This was a public project that utilized both historic preservation tax credit and new market tax credit. The sources of funds for the $9.8 million project included $2.8 million directly from Righteous Babe Records in the form of equity ($1,264,401 in partnership equity plus a direct infusion from Ms. DiFranco), $1.2 million in loans, and historic preservation tax credit and new market tax credits of $4.2 million, or 41% of the total funds (DeWine, Forthcoming). According to DeWine (Forthcoming) who conducted a case study on this project, the federal historic preservation tax credit

generated $1,700,000 (17.4% of total project cost) and the new market tax credit generated approximately $2.5 million (26% of total project cost).

### *3.4.5 Lessons Learned*

The historic house of worship on Delaware Avenue in Buffalo, NY, was built in 1876, but the building has been vacant since 1990. This building is currently reused as a performing arts center, contemporary art gallery, corporate offices and recording studio.

The project has not been a financial windfall for the initiators, but it is still a wonderful asset to the area. Righteous Babe Records also engaged the community who had a sympathetic ear for the reuse project. The local newspapers were also a source of support to push city government to assist the project (DeWine, Forthcoming). The due diligence process of assembling building professionals, finance experts, and legal counsel let Righteous Babe Records know what it was getting into. Because Righteous Babe did its "homework" by assembling a team of professionals, they were spared major surprises, although there were still a lot of little setbacks (DeWine, Forthcoming).

## *3.5 Office Space: the First Church of Christ Scientist, Cleveland, Ohio*

### *3.5.1 The Concept of the Project*

The First Church of Christ Scientist of Cleveland, originally built in 1931, was converted into office for the Nottingham-Spirk Innovation Center. This religious building was registered as a national historic place in 2003 (National Park Service, 2010). This reuse project saved an historic building, returned its property value back onto the tax rolls, and spurred economic growth and creativity. The First Church of

Christ Scientist sat vacant on Overlook Road on the east side of Cleveland for many years. It was a curiosity to those who passed by to see the interior of the elegant and enigmatic building designed by the Cleveland architectural firm of Walker & Weeks (RealNeo, 2010). Appendix N shows the location of the site, about 5.5 miles from downtown Cleveland and less than one mile from the Cleveland Clinic-University Hospital-University Circle cultural area, a powerful and growing economic driver in the area with over 40,000 jobs. In addition, this beautiful religious building is closely located to Case Western Reserve University, Historic District – Little Italy, and Severance Hall – home of the Cleveland Orchestra.

In the spring of 2003, working with City Architecture, Nottingham-Spirk began to renovate the First Church of Christ Scientist. Formerly separated between two buildings, the relocation of all Nottingham-Spirk employees and processes to one central location with 60,000 square feet of space and 5 floors has been a boon to the productivity of the firm, but it is the grandeur of the space that has proven to be the greatest inspiration (Nottingham-Spirk Design Associates, 2010).

Originally, the 4.5 acre site had one building of approximately 47,000 square feet. The reuse plan included a new 10,000 square feet building. Nottingham-Spirk & Design Inc. planned to invest $8 million to remodel portions of its new offices, renamed the Nottingham-Spirk Innovation Center (Cleveland Restoration Society, 2010). The building would accommodate the firm's 50 employees in one facility. Appendix O shows the bird's eye view.

*3.5.2 Site History*

The First Church of Christ, Scientist was completed in 1931 at a time when the Christian Science denomination was very active with at least seven churches in the greater Cleveland area. The building is prominently situated on the crest of the Allegheny escarpment at the eastern border of the city, overlooking Little Italy and the University Circle neighborhoods. The church building is located on the edge of City of Cleveland Heights. Its tall, thin bell tower provides a distinctive landmark. The building was designed by Walker & Weeks, Architects, one of Cleveland's leading firms during the first half of the 20th century. The building was originally intended for a site at the intersection of Euclid Avenue and East Boulevard, where Severance Hall – the home of the Cleveland Orchestra – now stands. Both buildings have octagonal configurations and were designed by the same firm. They were completed and opened the same year, although the First Church preceded Severance Hall, having been planned a year before in 1928. It is a superb example of 20th century Beaux Arts Classicism (Cleveland Restoration Society, 2010).

By the end of the 1990s, the congregation had diminished to the point where it could no longer keep the building, which had been scrupulously maintained throughout its more than 70 years in religious service. The congregation moved out in 2002. There were several potential buyers, but they all wanted to raze the building for new residential development. Fortunately, the owners of Nottingham-Spirk recognized the building's exceptional artistic and architectural quality and its potential for a unique and sensitive adaptive use (Cleveland Restoration Society, 2010).

*3.5.3 Market Conditions*

Cleveland's population has declined almost 10 percent from 2000 (433,748 in 2008, city-data.com). The surrounding suburbs have experienced similar declines, indicating that churches in these cities have probably been abandoned due to population decline. Estimated median household income in 2008 was $26,731 in Cleveland, $52,733 in Cleveland Heights and $72,201 in Shaker Heights (two proximal suburbs), while Ohio's estimated median household income in 2008 was $47,988. The 2008 estimated median house or condo value was $87,600 in Cleveland, $140,800 in Cleveland Heights, $232,109 in Shaker Heights, and $140,200 for the state of Ohio.

The number of building permits of single family housing in the City of Cleveland has sharply decreased after reaching its peak in 2005: 354 building permits in 2005, 253 building permits in 2006, 184 buildings permits in 2007 and 109 building permits in 2008. This trend was also seen in Cleveland Heights and in Shaker Heights. Their building permits of single family housing reached their peak in 2005 and have similarly declined.

The office vacancy rate in the Cleveland market area, affording to CoStar's market report of the fourth quarter in 2006 (costar.com), has decreased since the first quarter of 2005. In terms of vacancy rate of total office market, it was 16 percent at the first quarter in 2005, but the rate was decreased to 14 percent at the end of the fourth quarter in 2006. Another indicator, a rate of office employment growth, also shows a trend of office market from 2005 to 2006 was vitalized compared to the historic trends. It was even percent at the first quarter in 2005, but the rate was increased to almost 1 percent at the end of the fourth quarter.

From a brief market condition analysis, I conclude that population decline would be a main reason that churches in this area been abandoned, while relatively strong residential and office market conditions around 2005 have been working as a motivation of reuse project initiations.

### *3.5.4 Financing Issues*

Total project cost was approximately $8 million. The owners of the Nottingham-Spirk Design Association utilized the 20% federal historic preservation tax credit. They also utilized the new market tax credit of $500,000 invested by Cleveland Development Advisor (CDA) as a part of the new market tax credit awarded to CDA. In addition, as a Brownfield revitalization project in Cleveland with expectations for a positive externality, the Cuyahoga County government raised $1 million in 2003 to support the asbestos removal, interior demolition, and environmental testing at the former First Church of Christ Scientist.

### *3.5.5 Lessons Learned*

The historic preservation and adaptive reuse of the historic First Church of Christ Scientist has been undertaken to create a dramatic and compelling work environment for an innovation company. The conversion of this historic building to offices was comprehensive including use of the sanctuary / auditorium as a design studio, and renovation of the balcony into offices for incubator companies (City Architect, 2010).

Environmental concerns were also important factors in this redevelopment plan. As a Brownfield revitalization project in Cleveland with expectations for a positive

externality, Cuyahoga County government raised $1 million in 2003 to support the asbestos removal, interior demolition, and environmental testing at the former First Church of Christ Scientist (Choi, 2010). If a reuse project of a religious building is connected to environmental contaminations various financial supports can be provided by local governments.

This project was a new market tax credit deal: $500,000 was invested by Cleveland Development Advisor (CDA) as a part of the new market tax credit awarded to CDA. The church building now houses over 80 working staffs and the major exterior has been preserved. This modest size church reuse projected has been evaluated that the preserved exterior and newly hired staffs can have positive impact on surrounding nationhood.

### *3.6 Cultural Place: the Orthodox Jewish Congregation – Cheva Bikur Cholim in Seattle, WA*

#### *3.6.1 The Concept of the Project*

The Orthodox Jewish congregation Chevra Bikur Cholim in Seattle, WA has been reused for the Langston Hughes Performing Art Center since 1972. The building is listed in the National Register of Historic Places. The center is committed to championing a cultural and artistic voice while building powerful connections with the diverse cultures in the community. The center is located in the heart of Seattle within the vibrant central area neighborhood (Appendix P). Appendix Q shows bird’s eye view of the site. The building was constructed with traditional bluff stone and has arch windows.

*3.6.2 Site History*

Designed by B. Marcus Priteca and built in 1915, the synagogue served the Orthodox Jewish congregation – Chevra Bikur Cholim. The building was originally adapted as part of the Model Cities Program, a part of President Johnson's Great Society and War on Poverty initiatives. Running from 1966 to 1974, the program focused on improving the coordination of existing urban programs and providing additional funds for local plans. The program's initial goals emphasized comprehensive planning, involving not just rebuilding but also rehabilitation, social service delivery, and citizen participation

The City of Seattle purchased the center in 1971 and since then has continued the mission of the Center while updating and renovating the building (1971, 1991, 2003, and 2009). The Center is dedicated to celebrating, nurturing, presenting and preserving African-American performing arts and cultural legacies. Created to provide a cultural institution in Seattle's Central Area, LHPAC has been at the core of experimental, cutting edge, traditional, and emerging art forms for more than 30 years. It has been an essential gathering place for an African-American canon of work in a neighborhood that has seen numerous demographic changes over the past three decades. The Center is committed to championing a cultural and artistic voice while building powerful connections with the diverse cultures in the community. This is accomplished through the creation of dynamic performing arts experiences for all.

*3.6.3 Market Conditions*

Estimated population in Seattle was 598,541 in 2008, an increase of 6.2% since

2000 (Census Bureau, 2000). Estimated median household income in 2008 was $61,786, up from $45,736 in 2000. This is higher than the estimated median household income of $58,078 in 2008 for the state of Washington. Estimated median house or condo value in 2008 was $491,600, up from $252,100 in 2000. Again, this is higher than the estimated median house or condo value in the state of Washington at $308,100 in 2008 (city-data.com).

Appendix R shows a trend of single-family house construction building permits in Seattle. Compared to other major cities in the US, its decrease rate since 2002 is relatively low. Appendix S shows a trend of average cost to build a house. Average building cost has increased 44% since 2000.

### *3.6.4 Lessons Learned*

The Orthodox Jewish congregation Chevra Bikur Cholim in Seattle, WA has been reused as the Langston Hughes Performing Art Center since 1971, a non-profit project that now serves the American African community. The building is listed in the National Register of Historic Places. The Center is committed to championing a cultural and artistic voice while building powerful connections with the diverse cultures in the community. No tax credits were involved for this project.

## *3.7 Summary of the Multiple-Case Study*

The Meridian Street Methodist Episcopal Church located in Indianapolis, Indiana has been reused for market rate condominiums. The initial plan for the church was to demolish the original building, but the historic preservation commission of

Indiana listed the church as an historic place and encouraged the developer to preserve the original building. The reuse project now comprises 75 condominium units including the original church building and newly constructed building. In addition to historic and architectural significance, location characteristics were a significant factor to redevelop the original property.

Originally built in 1915, the Norte Dame Academy in Cleveland, Ohio was converted into a mix of low income and elderly housing. The Famicos Foundation, a non-profit organization that provides housing to Cleveland families, initiated this church and school conversion project in 1999. Because surrounding communities are low income, the conversion to low income housing was a reasonable option. This project shows an example that both the low income housing tax credit and the historic preservation tax credits were utilized.

The First Church of Christ Scientist in Cleveland, originally built in 1931, was converted into the Nottingham-Spirk Innovation Center. This project took advantage of the new market tax credit: $500,000 was invested by Cleveland Development Advisor (CDA) as a part of the new market tax credit awarded to CDA. The church building now houses over 80 employees. Major exterior features have been preserved.

The Orthodox Jewish congregation Chevra Bikur Cholim in Seattle, WA has been reused as the Langston Hughes Performing Art Center since 1972. The center is connected with the diverse cultures in the community. This project shows how a historic religious building can be utilized in terms of its architectural significances as a cultural center.

From these five cases, we may conclude that historic value and architectural

significance, as well as the communities' needs and location factors, influence decisions to initiate the reuse projects. These conclusions help frame the conceptual model of Chapter V in conjunction with the literature review in Chapter IV. In the next chapter III, background information is addressed.

# CHAPTER IV

## CONCENPTUAL FRAMEWORK AND HYPOTHESES

Chapter IV presents a conceptual framework and research hypotheses of this dissertation. A conceptual framework and research hypotheses of this dissertation have been driven by Chapter II and Chapter III which investigated literature review and case studies.

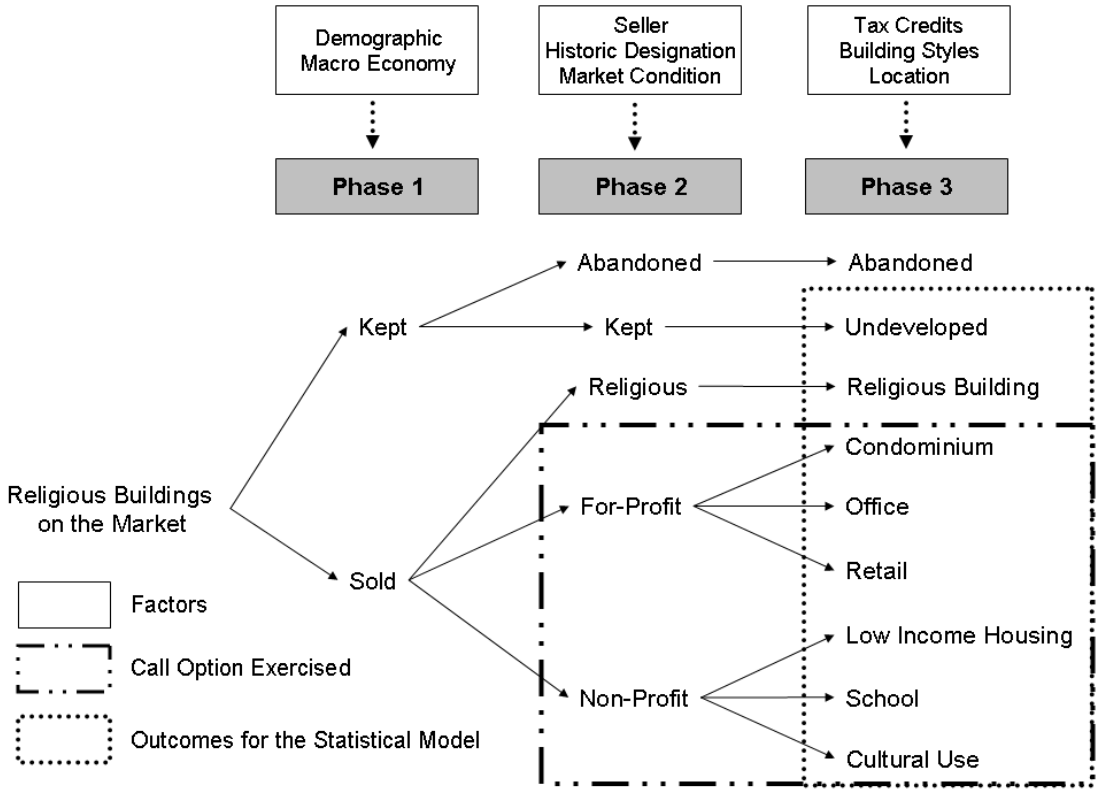
This dissertation hypothesizes whether or not national level historic designation can determine outcomes of religious building reuse projects, and whether or not there are relationships between commercial real estate market conditions and choices of reuse outcomes. It also hypothesizes the effects of tax credits, including the historic preservation tax credit, the low income housing tax credit and the new market tax credit, on initiators' choice of religious building reuse projects. At the conceptual level, this dissertation divides reuse projects outcomes into 8 types: religious buildings on the

market for more than  years (undeveloped), religious buildings sold to other religious entities (church to church), and religious buildings reused for condominiums (condo), offices (office), retail places (retail), low income housing (LIH), schools (school) and cultural uses (cultural).

*4.1 Conceptual Framework: A Reuse Choice Model for the Initiators*

Figure 4-1 is a conceptual model for the initiators that may be considered as a reuse choice model for this dissertation. This reuse choice model shows a structure of the initiator's decision making processes when religious buildings are placed on the market divided into three phases. Outcomes (options) at each Phase tend to be affected by different factors.

Figure 4-1 Conceptual Reuse Choice Model




In Phase 1, religious buildings are placed on the market with two options: "Kept" and "Sold." At Phase 1, demographic shifts and macro economic trends affect whether religious buildings on the market can be sold to other buyers or the buildings cannot be sold and are kept as original owners' assets. All potential buyers of religious buildings, including religious entities, for-profit users and non-profit users, may be affected by demographic shifts and macro economic trends. However, other factors such as seller's denomination and tax credits do not play a role in during Phase 1.

In Phase 2, religious buildings are sold for reuse under three options: "Religious," "For-Profit" and "Non-Profit." If religious buildings are unsold after Phase

1, such buildings are still defined as “Kept” at Phase 2. At Phase 2, the seller’s denomination, local commercial market conditions and historic designation might determine what reuse is available for religious buildings and the for-profit or non-profit outcomes. We have assumed that hierarchical sellers prefer to be reused for non-profit outcomes when they cannot find other religious entities as their buyers (Simons and Choi, Forthcoming). Local commercial market factors also play a core role at Phase 2. If the local commercial market does not guarantee enough rate of return of for-profit investment, the developer will delay a decision to invest, described by the call option theory presented earlier. Conversely, non-profit initiators (local government and community development corporations) are not as significantly affected by local commercial market conditions. Historic designation plays a core role at Phase 2 because non-profit users are not affected by the historic status of the building while for-profit users may consider the building with historic designation as more attractive to potential buyers or occupants (Simons and Choi, Forthcoming).

Once religious buildings are sold, initiators will decide the building’s final outcomes based on the mitigating variables. In Phase 3, tax credits, building characteristics and location factors might determine the variety of potential final outcomes: condominiums, offices, retail shops, low income housing, schools and cultural uses. Religious buildings can be reused for other religious entities’ worship places and “Kept” buildings might remain as undeveloped. We assume that when religious buildings are sold to the potential developers for profit, the call option is exercised.

*4.2 Research Hypotheses*

The dissertation herein is mainly concerned with relationships between tax credits – the historic preservation tax credit, the low income housing tax credit and the new market tax credit – and choices of outcomes of religious building reuse projects. Secondary hypotheses address the effects of national level historic designations and local commercial market conditions on choices of outcomes of religious building reuse projects. Hypotheses in this dissertation are derived from the summary of literature review in Table 2-1.

*4.2.1 Research Hypotheses Group A: National Historic Designation*

*4.2.1.1 (National) Historic District Location*

Null Hypothesis: Whether or not religious buildings are located in a national historic district cannot determine outcomes of reuse projects of religious buildings.

Alternative Hypothesis: Whether or not religious buildings are located in a national historic district can determine outcomes of reuse projects of religious buildings.

Statistical Hypotheses “Group A” states the relationship between reuse outcomes and national historic designations. These hypotheses were driven by previous literature. Since if religious buildings are located in national historic districts and they are designated as national sacred landmarks, such designations give owners or potential developers and advantage in the competitive process of grant application and create an

identifiable voice in community affair, national historic designations will be preferred by potential developers. Because there was no empirical study that has tested these relationships, however, I use two-tail settings for the hypotheses. Therefore statistically hypotheses are as follows:

$H_{1-1}$ = There is no relationship between the location of historic district and a condominium as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{1-2}$ = There is no relationship between the location of historic district and an office as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{1-3}$ = There is no relationship between the location of historic district and a retail place as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{1-4}$ = There is no relationship between the location of historic district and low income housing as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{1-5}$ = There is no relationship between the location of historic district and a school as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{1-6}$ = There is no relationship between the location of historic district and a cultural place as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

*4.2.1.2 (National) Sacred Landmark*

Null Hypothesis: Whether or not religious buildings were designated as a national sacred landmark cannot determine outcomes of reuse projects.

Alternative Hypothesis: Whether or not religious buildings were designated as a national sacred landmark can determine outcomes of reuse projects.

Thus testable statistical hypotheses sacred landmarks are as follows:

$H_{2-1}$ = There is no relationship between the national designations as a sacred landmark and a condominium as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{2-2}$ = There is no relationship between the national designation as a sacred landmark and an office as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{2-3}$ = There is no relationship between the national designation as a sacred landmark and a retail space as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{2-4}$ = There no relationship between the national designation as a sacred landmark and low income housing as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{2-5}$ = There is no relationship between the national designation as a sacred landmark and a school as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{2-6}$ = There is no relationship between the national designation as a sacred landmark and a cultural place as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

The following hypotheses are the relationships between office and retail market conditions, and choices of outcomes of religious building reuse projects. Although I assume positive relationships between commercial real estate market conditions and for-profit outcomes including condominiums, offices and retail, I use two-tail setting for hypotheses group B because previous studies have not tested this relationship.

*4.2.2 Hypotheses Group B: Local Commercial Market Conditions*

*4.2.2.1 Office Market*

Null Hypothesis: Office occupancy rates in surrounding neighborhood can not determine choices of reuse outcomes of religious buildings.

Alternative Hypothesis: Office occupancy rates in surrounding neighborhood can determine choices of reuse outcomes of religious buildings.

Thus testable statistical hypotheses of office market are as follows:

$H_{3-1}$ = There is no relationship between office occupancy rate and a condominium as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{3-2}$ = There is no relationship between office occupancy rate and a office as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{3-3}$ = There is no relationship between office occupancy rate and a retail space as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{3-4}$ = There is no relationship between office occupancy rate and low income housing as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{3-5}$ = There no relationship between office occupancy rate and a school as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{3-6}$ = There is no relationship between office occupancy rate and a cultural place as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

*4.2.2.2 Retail Market*

Null Hypothesis: Retail occupancy rates in surrounding neighborhood can not determine choices of reuse outcomes of religious buildings.

Alternative Hypothesis: Retail occupancy rates in surrounding neighborhood can determine choices of reuse outcomes of religious buildings.

Thus statistical hypotheses of retail market conditions are as follows:

$H_{4-1}$ = There is no relationship between retail occupancy rate and condominium as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{4-2}$ = There is no relationship between retail occupancy rate and office as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{4-3}$ = There is no relationship between retail occupancy rate and retail space as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{4-4}$ = There no relationship between retail occupancy rate and low income housing as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{4-5}$ = There is no relationship between retail occupancy rate and a school as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

$H_{4-6}$ = There is no relationship retail occupancy rate and a cultural place as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 \neq 0$$

The main focus of this dissertation is to find out relationship between tax credits and choices of outcomes of religious building reuse projects. The relationships between such credits and reuse outcomes are enforced by the federal laws: the federal historic preservation tax credit is based on Section 48 and Section 170 of the Internal Revenue Code of 1986 (National Park Service, 2010); the low income housing tax credit is based on Section 42 of the Internal Revenue Code, enacted in 1986 and made permanent in 1993 (National Association of Housing and Redevelopment Officials, 2010); and the new market tax credit is a part of the Community Development Financial Institutions Fund (the CDFI Fund). The CDFI Fund was established by the Riegle Community Development and Relatory Improvement Act of 1994, as a bipartisan initiative (U.S. Department of the Treasury, 2010). By the law, the historic reservation tax credits can be used to finance retail, office and low income outcomes and the new market tax credit can be used to finance retail and office outcomes. In addition, the low income housing tax credit is used to finance low income housing outcomes. Therefore hypotheses Group C has three testable hypotheses, Group D has one hypotheses and Group E has two testable hypotheses.

### *4.2.3 Hypotheses Group C: Tax Credits*

#### *4.2.3.1 Historic Preservation Tax Credit:*

Null Hypothesis: The historic preservation tax credit can not determine choices of reuse outcomes of religious buildings.

Alternative Hypothesis: The historic preservation tax credit can determine choices of reuse outcomes of religious buildings.

The historic preservation tax credit is positive to office, retail and low income housing outcomes. Thus testable statistical null hypotheses of the historic preservation tax credit are as follows:

$H_{5-1}$ = There is no relationship between the historic preservation tax credit and office as reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 > 0$$

$H_{5-2}$ = There is no relationship between the historic preservation tax credit and retail space as reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 > 0$$

$H_{5-3}$ = There is no relationship between the historic preservation tax credit and low income housing as reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 > 0$$

*4.2.3.2 Low Income Housing Tax Credit:*

Null Hypothesis: The low income housing tax credit can not determine choices of reuse outcomes of religious buildings.

Alternative Hypothesis: The low income housing tax credit can determine choices of reuse outcomes of religious buildings.

The low income housing tax credit is used for low income rental housing outcome. Thus testable statistical null hypotheses of the low income housing tax credit are as follows:

$H_{6-1}$ = There is no relationship between the low income housing tax credit and low income housing as a reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 > 0$$

*4.2.3.3 New Market Tax Credit:*

Null Hypothesis: The new market tax credit can not determine choices of reuse outcomes of religious buildings.

Alternative Hypothesis: The new market tax credit can determine choices of reuse outcomes of religious buildings.

The new market tax credit can be utilized for retail and office outcomes. Thus testable statistical null hypotheses of the new market tax credit are as follows:

$H_{7-1}$ = There is no relationship between the new market tax credit and an office as reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 > 0$$

$H_{7-2}$ = There is no relationship between the new market tax credit and retail space as reuse outcome.

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 > 0$$

This dissertation now moves on from conceptual framework and research hypotheses to research methods.

# CHAPTER V

## RESEARCH DESIGN

Chapter V describes the research design used to test the hypotheses addressed in Chapter IV. The first part of Chapter V discusses the sampling methods for this dissertation and also discusses possible internal and external validity threats of the sample. The second part of this chapter presents models and descriptive statistics of continuous variables and binary dummy variables.

The multinomial logit regression model is engaged, using religious buildings in the United States as the unit of analysis. In the sample, there are three groups of religious buildings: reused for different purposes; reused for the same purposes (i.e. sold to other religious entities to remain as worship places); and religious buildings on the market for more than 3 years. The dependent variable is a discrete variable including eight outcomes. Independent variables are literature driven and include internal and external

variables. Dummy variables indicating location of national historic district and sacred landmark designation are considered as independent variables. Office and retail occupation rate by zip code are included as independent variables. In addition, tax credit variables including the historic preservation tax credit, the low income housing tax credit and the new market tax credit are included as independent variables.

Before running the multinomial logit models, correlation analyses were conducted to identify high correlation among independent variables. The multinomial logit model was specified based on the results of the correlation analyses. In addition, a binary logit regression analysis was performed using a binary dependent variable indicating how religious buildings were reused: non religious purposes (coded as 1) or religious purposes (coded as 0).

### *5.1 Description of the Sample*

This section addresses the sampling methods and validity threats, focusing on both the internal and external validity threats generated by the sampling methods of this dissertation. In addition, this section also provides basic characteristics of the sample of this dissertation for the multinomial logit models.

#### *5.1.1 Sampling Methods*

This dissertation used individual religious buildings in the United States as the unit of analysis. The sample used in this dissertation can be classified into three groups: religious buildings adaptively reused for different purposes since 1980s; religious buildings that have been placed on the market for more than three years (undeveloped;

on the market); and religious buildings sold to other religious entities (church to church) since. This dissertation includes 204 reused church buildings, 92 church-to-church cases, and 45 buildings on the market for more than three years.

The listed groups of religious buildings used for the analysis were constructed from stratified sampling methods, rather than sampling from the total population at large, to ensure that an appropriate number of units were drawn from the homogeneous subsets of that population (Babbie, 2004). The total population was comprised of religious buildings placed on the market in the United States since 1980. The population was then sorted into three homogeneous subsets: religious buildings reused for different purposes; religious buildings sold to other religious buildings; and religious buildings on the market for more than three years. Different strategies were employed to select the appropriate number of elements from each subset.

The CoStar database [10] (www.costar.com) provided data for 92 religious buildings sold to other religious entities (church to church) using a systematic sampling method. In systematic sampling, every *k*th element in the total list is chosen systematically for inclusion in the sample (Babbie, 2004). There were 2026 religious buildings in the database that had been sold to other religious entities since 1990 (up to September 2009) and every 20$^{th}$ religious building, arranged in order of sales price was selected for the sample. However, among the 101 selected religious buildings, nine

[10] Religious buildings placed on the market for more than three years have been obtained from CoStar Group's database. Religious buildings under this category (undeveloped) play a core role as a control group in this study. The CoStar Group also lists religious buildings which are currently for sale with basic building, location and sales information including the number of days on the market. If religious buildings have been placed on the market more than 3 years (e.g., 1,095 days), those properties were included in the sample.

religious buildings were excluded because they were since demolished. The CoStar database also provided information for 45 religious buildings placed on the market for more than three years; this subset appeared to be all buildings meeting the criteria in the database at the time of sampling. Finally, the list of religious buildings reused for different purposes was obtained from various sources using a non-probability sampling; this third group of religious buildings might be biased. Unlike religious buildings sold to other religious entities or buildings on the market for more than three years, the degree to which religious buildings in this group differs from the population remains unknown, thus warranting a non-probability sampling method (Babbie, 2004). To minimize any bias that may be generated by non-probability sampling, three main sources were consulted to make the list of religious buildings reused for different purposes: non-profit organizations' websites, CoStar's database, and electronic articles. Religious buildings obtained from these sources were not excluded without reasonable cause: all reuse cases of religious buildings that have been listed in non-profit organizations' websites[11] and CoStar's database were included, meaning that there were no differences in probabilities to the selected religious buildings.

In the United States, there are many active non-profit organizations that strive to develop economically-viable solutions to preservation challenges in order to enhance the historic and architectural heritage. For example, Cleveland Restoration Society (www.clevelandrestoration.org) listed several historic religious buildings reused for either commercial or residential purposes in the Greater Cleveland Region with brief

[11] Usually theses organizations refer to non-profit entities which use the tool of historic preservation to revitalize communities and strengthen the regional economy.

project information on its website. Such websites have been main sources to obtain a list of reuse projects of historic religious buildings.

The CoStar Group has also provided information on many reuse cases of religious facilities. The CoStar Group database system has listed religious buildings sold since the late 1990s. Its database includes brief information about the religious buildings as well as their purpose of sales (e.g., investment, religious purpose, etc.). Properties sold for investment were traced to identify their current uses. If their current uses are not religious purposes, those religious buildings were included in the sample under “reused” category.

Other electronic sources were investigated for data in this research. To obtain religious buildings reused for different purposes, “reuse of religious buildings,” “historic church reuse,” and “church reuse project” were frequently used as key words for searching engines (e.g., Google, Yahoo, etc.).

### *5.1.2 Validity Threats*

As mentioned, I used a non-probability sampling method to make the list of religious buildings reused for different purposes in the United States. This sampling method, however, generates internal and external validity threats.

There are internal validity threats to the sampling method in this dissertation. A threat to internal validity comes from selection bias and ambiguous temporal precedence. Selection bias is one of internal validity threats that can be occurred when there are systematic differences between groups over conditions in cases that could also cause the observed effects (Shadish, Cook and Campbell, 2002). Three sub-groups of the sample

including religious buildings adaptively reused for different purposes, on the market, and sold to other religious buildings have different populations meaning the sample in each group was collected from difference sources. Therefore religious buildings in each group might already differ. Ambiguous temporal precedence as an internal validity threats refers that causation is bidirectional (Shadish, Cook and Campbell, 2002). In this dissertation, several variables and reuse outcomes are correlated. For example, growing population can be induced by redevelopments of religious buildings especially in the core urban areas vice versa.

Moreover, there is an external validity threat in this dissertation. External validity concerns inferences about the extent to which a causal relationship holds over variations in persons, settings, treatments, and outcomes (Shadish, Cook and Campbell, 2002). In this dissertation, for example, external validity refers to the extent to which determinants tested in this dissertation can also determine reuse outcomes of religious buildings that are not included in the sample of this dissertation. I used a non-probability sampling method to get a list of religious buildings reused for different purposes in the United States. In other words, the list of this group represents a non-random subset of the actual cases of this type in the US meaning results can be biased and can not represent the population. To minimize external validity threats, religious buildings obtained from these sources were not excluded without reasonable cause: all reuse cases of religious buildings that have been listed in non-profit organizations' websites[12] and CoStar's database were included, meaning that there were no differences in probabilities

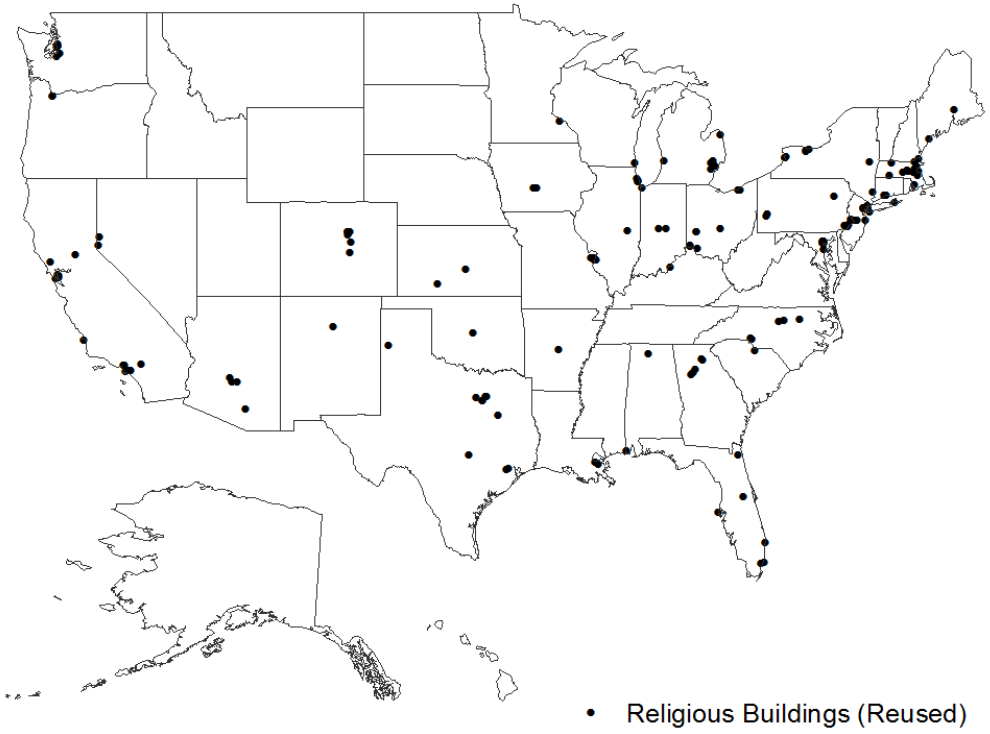
[12] Usually theses organizations refer to non-profit entities which use the tool of historic preservation to revitalize communities and strengthen the regional economy.

to the selected religious buildings.

### *5.1.3 Distribution of the Sample*

Figure 5-1 shows a distribution of religious buildings adaptively reused for different purposes.

Figure 5-1 Distribution of Religious Buildings Adaptively Reused

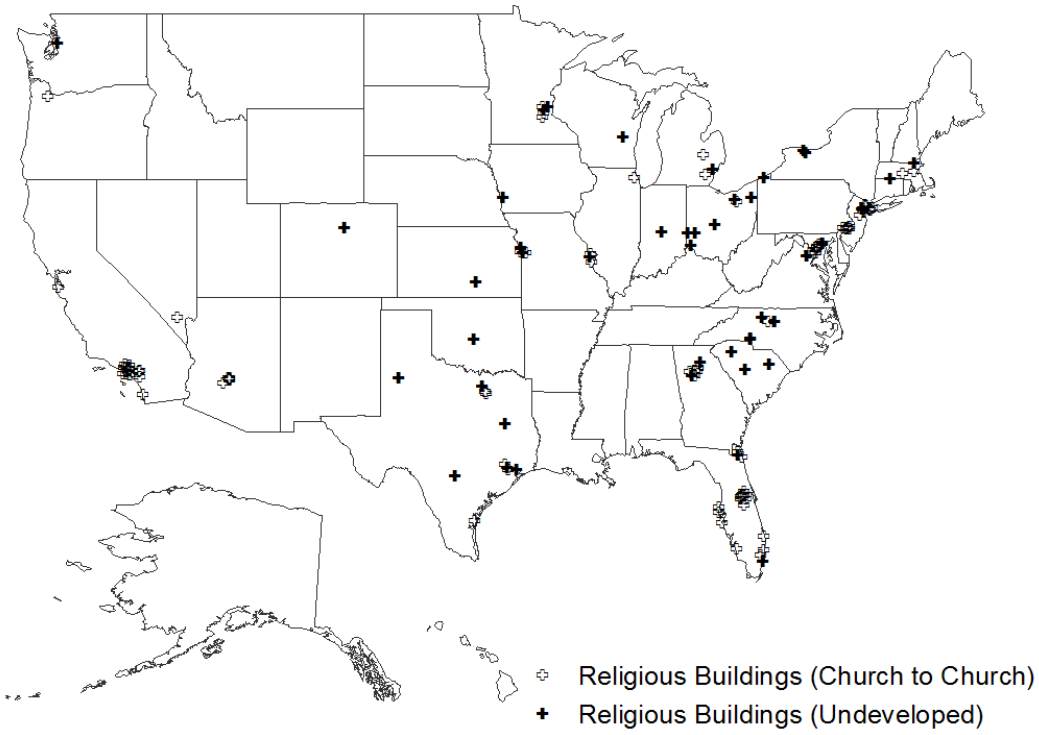



Six US states have more than 10 religious buildings adaptively reused for different purposes. Massachusetts has 39 religious buildings, followed by New York (23 buildings), California (14 buildings), Pennsylvania (12 buildings), Ohio (11 buildings)

and Texas (10 buildings). Thirty-three 33 states have at least one religious building adaptively reused.

Figure 5-2 shows a distribution of religious buildings on the market for more than three years and religious buildings sold to other religious entities.

Figure 5-2 Distribution of Religious Buildings on the Market or Sold to other Religious entities




Seven US states have more than five religious buildings sold to other religious entities to reuse the properties as worship spaces. California has 19 religious buildings in my sample, followed by Florida (18), New Jersey (8), Georgia (7), Texas (6), Arizona (5) and Maryland (5). Four US states have more than 3 religious buildings on the market

for more than 3 years: Ohio and Texas each have six religious buildings on the market, followed by North Carolina (5) and South Carolina (3).

*5.2 The Data*

This dissertation uses possible outcomes of religious building reuse projects used in Simons and Choi's article (Forthcoming) as a nominal dependent variable. However, "school" and "church" are included in this dissertation as reuse outcomes that were not included in their paper. Possible outcomes used in this dissertation are as follows:

- *Residential Condominium*: this outcome includes religious buildings that are currently reused for market rate condominiums. Creative "loft style" for-sale multifamily housing was included in this category. It is expected that for church projects, condominiums are the dominant reuse because of the buildings' attractive and valuable architectural features.
- *Low Income Housing:* this outcome mainly includes religious buildings that are currently reused for rental housing intended for low income households. Low Income Tax Credits tend to be used to finance these projects.
- *Retail*: this outcome includes religious buildings that are currently reused for retail purposes. Restaurants, book stores, themed centers, commercial parking lots, and various small scale shops were included in this category.

- *Office*: this outcome includes religious buildings that are currently reused for office spaces. This category includes both owner-occupied spaces and leased spaces.
- *Cultural Use*: this outcome includes religious buildings that are currently reused for various cultural uses. Museums, art galleries and concert halls that are used by not-for-profit space users were included in this category. If one religious building has been reused as a for for-profit cultural center, it is considered as (commercial) retail because the main purpose of the adaptive reuse project is to generate profits
- *School*: this outcome includes religious buildings that are currently reused for schools. Both private and public schools and several university buildings were included in this category.
- *Church*: when religious buildings have been placed on the market, other religious entities are the strongest candidates to reuse those buildings for their worship places. Religious buildings sold to other religious entities were included in this category.
- *Undeveloped:* this is not one of the project outcomes. This study defines undeveloped religious buildings, in terms of adaptive reuse projects, as religious buildings on the market for more than three years.

Table 5-1 shows the number of religious buildings (samples) for each outcome category. Among 341 religious buildings currently reused for different purposes,

condominiums are the dominant reuse outcome at 14.7% (50 buildings) of total religious buildings in the sample and 24.5% of religious buildings reused for different purposes. Retail places are ranked as the second dominant outcome at 12.3% (42 buildings) of total religious buildings in the sample and 20.6% of total religious buildings reused for different purposes. Cultural places as a reuse outcome are 11.7% (40 buildings) of total religious buildings in the sample and 19.6% of total religious buildings reused for different purposes. Offices as a reuse outcome are 7.6% (26 buildings) of total religious buildings in the sample and 12.8% of religious buildings reused for different purposes. Schools and low income housing are 7% (24 buildings) and 6.5% (22 buildings) of total religious buildings in the sample and 11.8% and 10.8% of religious buildings reused for different purposes, respectively. There were 45 religious buildings placed on the market for more than 3 years included. These undeveloped cases account for 13.2% of total religious buildings in the sample. In addition, 92 religious buildings sold to other religious entities are included in the sample as a control group and these case amounts to 27% of the total religious buildings in the sample.

Table 5-1 Religious Buildings in Each Outcome

| Outcomes | Total | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Undeveloped | 45 | 13.20% | NA |
| Church to church | 92 | 27.00% | NA |
| Condominium | 50 | 14.70% | 24.51% |
| Office | 26 | 7.60% | 12.75% |
| Retail Place | 42 | 12.30% | 20.59% |
| Low income housing | 22 | 6.50% | 10.78% |
| School | 24 | 7.00% | 11.76% |
| Cultural Place | 40 | 11.70% | 19.61% |
| Total | 341 | 100.00% | 100.00% |

Note: column (1) denotes number of religious buildings in each outcome, (2) denotes the percentage of each outcome as to the number of total samples and (3) denotes the percentage of outcomes that adaptively reused for different purposes as to the total number of reused outcomes.

Among 341 religious buildings, 43 religious buildings are located in the state of Massachusetts (12.6% of total religious buildings in the sample), followed by California (33 buildings), New York (28), Florida (26) and Texas (22). In Massachusetts, condominiums as a reuse outcome are dominant while only four condominium cases in California are included in the sample.

Table 5-2 shows the independent variables used in this dissertation for statistical analyses. As mentioned in Chapter 4, a vector of building characteristics, location characteristics, local commercial market conditions, macro-economic trends, seller's denomination, historic designation, and tax credits were derived from previous literature.

Table 5-2 Independent Variables

| Explanatory Variables | Description | Source |
|---|---|---|
| *Building Characteristics* | | |
| LNBLDFTPRINT | The natural log of the building foot print | Microsoft Bing Map (http://maps.live.com/) or CoStar Group (http://www.costar.com/) |
| LNBLDSIZE | The natural log of the building size in square feet | Building Foot Print multiplied by the number of stories (calculated by the author) |
| LNLOTSIZE | The natural log of the lot size in square feet | Counties' Property Records or CoStar Group (http://www.costar.com/) |
| FAR | Floor Area Ratio | Lot Size divided by Building Foot Print (calculated by the author) |
| STORY | Number of stories | Microsoft Bing Map (http://maps.live.com/) |
| AGE | Age of properties from built year to year placed to the market | Counties' Property Records or CoStar Group (http://www.costar.com/) |
| STEEPLE* | A dummy variable indicating a property has a steeple (yes=1) | Microsoft Bing Map (http://maps.live.com/) |
| BLUFF_STONE | A dummy variable indicating property's building material is bluff stone (yes=1) | Microsoft Bing Map (http://maps.live.com/) |
| RED_BRICK | A dummy variable indicating property's building material is red brick (yes=1) | Microsoft Bing Map (http://maps.live.com/) |
| *Location Characteristics* | | |
| PARK | The distance from the nearest park in driving miles | Microsoft Bing Map (http://maps.live.com/) |
| LAKE | The distance from the nearest lake in driving miles | Microsoft Bing Map (http://maps.live.com/) |
| HIGHWAY | The distance from the nearest highway in driving miles (yes=1) | Microsoft Bing Map (http://maps.live.com/) |
| MAIN_ST** | A dummy variable indicating a property is located on a main street (yes=1) | Microsoft Bing Map (http://maps.live.com/) |
| CENTRALCITY | A dummy variable indicating whether or not a property is located in the central city of MSA (yes=1) | Counties' Property Records or original sources |
| MA | A dummy variable indicating whether or not a property is located in Massachusetts (yes=1) | Counties' Property Records or original sources |
| CA | A dummy variable indicating whether or not a property is located in California (yes=1) | Counties' Property Records or original sources |
| NY | A dummy variable indicating whether or not a property is located in New York (yes=1) | Counties' Property Records or original sources |

| Explanatory Variables | Description | Source |
|---|---|---|
| FL | A dummy variables indicating whether or not a property is located in Florida (yes=1) | Counties' Property Records or original sources |
| TX | A dummy variables indicating whether or not a property is located in Texas (yes=1) | Counties' Property Records or original sources |
| *Demographic Sifts* | | |
| POPCHANGE | Change of total population in by census tract (1990-2000) | Census Bureau 1990 and 2000 (http://www.census.gov/) |
| INCOMECHANGE | Change of medium household income by census tract (1990-2000) | Census Bureau 1990 and 2000 (http://www.census.gov/) |
| OWNERCHANGE | Percentage change of owner occupied housing by census tract (1990-2000) | Census Bureau 1990 and 2000 (http://www.census.gov/) |
| *Macro Economic* | | |
| UNEMPLOYMENT | Unemployment rate in a year when a property was placed on the market | Bureau of Labor Statistics (www.bls.gov/) |
| TBILL | T-Bill rate (secondary market) in a year when a property was placed on the market | U.S. Department of Treasury (www.ustreas.gov/) |
| *Local commercial market Condition* | | |
| OFFICE | Office occupation rate by zip code in 2000 | CoStar Group (http://www.costar.com/) |
| RETAIL | Retail occupation rate by zip code in 2000 | CoStar Group (http://www.costar.com/) |
| HIFAITH*** | A dummy variable indicating whether nor not a church has a hierarchical decision making process (yes=1) | Counties' Property Records or original sources |
| *Historic Designation* | | |
| HISLNDMARK | A dummy variable indicating a property was designated as a national historic landmark (yes=1) | U.S. Department of Interior (www.doi.gov/) |
| HISDISTRICT | A dummy variable indicating a property is located in a national historic place (yes=1) | U.S. Department of Interior (www.doi.gov/) |
| *Tax Credits* | | |
| HPTC | A dummy variable indicating a project partially financed by historic preservation tax credit (yes=1) or logged actual amount of money in dollars (adjusted in year 2010) | U.S. Department of Interior (www.doi.gov/) |
| LIHTC | A dummy variable indicating a project partially financed by low income housing tax credit (yes=1) or logged actual amount of money in dollars (adjusted in year 2010) | U.S. Department of Housing and Urban Development (www.hud.gov/) |

| Explanatory Variables | Description | Source |
|---|---|---|
| NMTC | A dummy variable indicating a project partially financed by new market tax credit (yes=1) or logged actual amount of money in dollars (adjusted in year 2010) | U.S. Department of Treasury (www.ustreas.gov/) |

Notes:
* This dissertation defines a steeple as a tall structure placed on the top of a religious building or stand-alone structure near a religious building.
** This dissertation defines a main street as a street that delivers traffics from smaller roads to highways.
*** We assume that all Catholic churches and churches of Christ Scientist have hierarchical decision making process.

To control for the effects of building characteristics on reuse decision of project initiators, this study includes the natural log of the size of building foot print in square feet (LNBLDFTPRINT), the natural log of building size in square feet (LNBLDSIZE), the natural log of lot size in square feet (LNLOTSIZE), floor area ratio (FAR), the number of stories (STORY), property age (AGE), and a dummy variable indicating whether or not a religious building has a steeple (STEEPLE). FAR is a proxy for the parking space because smaller FAR values indicate larger extra space in the lot. Data for buildings' physical characteristics were obtained from either county property records or CoStar Group's database system (www.costar.com).

To control for the effects of location characteristics on reuse decision of project initiators, this study include the distance from the nearest park (PARK), lake (LAKE) and highway (HIGHWAY). This study also includes a dummy variable indicating a religious building is located in the major street (MAIN_ST) and another dummy variable indicating a religious building is located in the central city of US Metropolitan Statistical Area (CENTRALCITY). The proximity to the nearest park, lake and highway, and the main street location were measured through "Microsoft Bing Map" as they provide the

distance from the subject to the proximity and "bird eye view." Five state dummy variables were included to control variety of reuse project outcomes of religious buildings over state by state. MA, CA, NY, FL and TX indicate properties are located in the state of Massachusetts, California, New York, Florida or Texas. These are the top five states where adaptive reuse projects of religious buildings were initiated.

To control for the effects of demographics shifts on reuse decision of project initiators, the percentage change of total population (POPCHANGE), the median household income change (INCOMECHANGE), and owner-occupied housing (OWNERCHANGE) change were included. The percentage change of the ten years prior to when the project was initiated is included for these shifts. For example, if a religious building has been reused since 1995, the percentage change from 1980 to 1990 was used. This data was obtained from the US Census Bureau.

To control for the effects of macro economic trends on reuse decision of project initiators, the unemployment rate (UNEMPLOYMENT) and Treasury Bill rate (TBILL) are included as variables. The unemployment rates were obtained from the Bureau of Labor Statistics and Treasury bill rate (1-year Treasury Bill secondary market rate, discount basis[13]) was obtained from U.S. Department of Treasury.

To control for the effects of local commercial market condition, including office market and retail market, office occupation rate by zip code in 2000 (OFFICE) and retail occupation rate by zip code in 2000 (RETAIL) were used. Data for office and retail occupation rate by zip code were from CoStar Group (www.costar.com).

To control for the effects of sellers' denomination on reuse decision of project

[13] Treasury bills of auction high are not available after 2002

initiators, a dummy variable indicating whether or not a religious building was occupied by a hierarchical denomination (HIFAITH), including Catholic Churches and Churches of Christ Scientists, was used. In this study, Catholic and Christ Scientist religious buildings are considered to have hierarchical decision making process. For most of the cases, the data of the denomination titles was obtained from original sources, but several cases without clear original source access required the use of counties' property records to confirm the denominations.

Two dummy variables measure the effects of historic designations on reuse decision of project initiators: one dummy variable indicates a religious building has been designated as a national historic landmark itself (HISLNDMARK) and the other dummy variable indicates a religious building is located in a historic place or historic district (HISDISTRICT). A list of historic places including historic districts and landmarks was obtained from the US Department of Interior and then the list was compared with the list of religious buildings in the sample of the study. Although whether a religious building has been designated as an historic landmark or a religious building is in an historic district may be affected by similar regulations with similar incentives, this study assumes that perception to the initiators can be different and therefore divides these two dummy variables.

As mentioned, three tax credits were included in this dissertation to estimate the effects of tax credits on decision of project initiators: one dummy or continues variable indicates the historic preservation tax credit was used to finance the project of a religious building reuse (HPTC), another dummy or continues variable indicates the low income housing tax credit was used to finance the project (LIHTC), and the third dummy or

continues variable indicates the new market tax credit was used to finance the project (NMTC). The list of projects that used the historic preservation tax credit was obtained from the Department of Interior, and the list of low income housing projects that used credit was obtained from the Department of Housing and Urban Development. Religious building reuse projects financed by the new market tax credit were confirmed by the Department of Treasury. The actual amounts of the three tax credit variables was factored in for each project, adjusted for the dollar in 2010 using the inflation calculator provided by the Bureau of Labor Statistics.

Table 5-3 includes descriptive statistics of religious buildings on the market for more than 3 years, adaptively reused, and sold to other religious entities as well as descriptive statistics of the total sample. The mean values of each variable of religious buildings reused for different purposes and sold to other religious entities are compared to the mean values of religious buildings on the market. This comparison will allow a check as to which variables might determine reuse outcomes.

Table 5-3 Descriptive Statistics of Continuous Variables

| Variables | Total Sample | | On the Market (over 3 year) | | Adaptive Reuse | | | Religious Reuse | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | S.D | Mean | S.D | Mean | S.D | % difference* | Mean | S.D | % difference** |
| BLDFTPRINT (SF) | 21,611.52 | 30,569.04 | 24186.52 | 31851.28 | 20230.24 | 30572.91 | -16.36% | 23414.84 | 30082.11 | -3.19% |
| BLDSIZE (SF) | 38,010.49 | 60,959.79 | 36656.48 | 61189.13 | 39667.91 | 63910.67 | 8.22% | 34997.64 | 54277.02 | -4.53% |
| LOTSIZE (SF) | 128,263.48 | 239,366.14 | 147969.28 | 159364.71 | 111761.73 | 237591.76 | -24.47% | 155215.59 | 272635.58 | 4.90% |
| FAR (%) | 0.38 | 0.29 | 0.36 | 0.28 | 0.46 | 0.30 | 0.10% | 0.21% | 0.20 | -0.15% |
| STORY | 1.86 | .94 | 1.64 | .68 | 2.08 | 1.03 | 26.44% | 1.48% | .67 | -10.20% |
| AGE | 65.54 | 34.45 | 52.31 | 29.74 | 75.80 | 35.10 | 44.90% | 49.25 | 25.84 | -5.85% |
| PARK (mile) | .86 | 1.58 | .95 | .84 | .82 | 1.92 | -13.23% | .92 | .84 | -3.06% |
| LAKE (mile) | 2.07 | 3.05 | 2.51 | 3.99 | 1.94 | 2.97 | -22.85% | 2.16 | 2.67 | -14.16% |
| HIGHWAY (mile) | 1.69 | 2.49 | 1.81 | 1.80 | 1.62 | 2.81 | -10.58% | 1.78 | 2.02 | -1.44% |
| POPCHANGE (%) | 7.40% | 17.88% | 8.92% | 17.45% | 4.60% | 17.02% | -4.32% | 12.85% | 18.78% | 3.93% |
| WHITECHANGE (%) | -0.02% | 45.74% | -12.15% | 49.28% | -3.79% | 42.85% | 8.36% | 14.26% | 47.27% | 26.40% |
| INCOMECHANGE (%) | 42.39% | 26.06% | 39.91% | 16.29% | 43.99% | 29.94% | 4.08% | 40.07% | 19.90% | 0.16% |
| EDUCHANGE (%) | 9.36% | 15.07% | 8.85% | 11.33% | 7.85% | 14.44% | -1.00% | 12.95% | 17.42% | 4.10% |
| UNEMPLOYMENT (%) | 5.19% | 0.93% | 5.86% | 1.42% | 5.09% | 0.65% | -0.77% | 5.08% | 1.02% | -0.78% |
| TBILL (%) | 3.09% | 0.83% | 2.82% | 1.40% | 3.17% | 0.62% | 0.36% | 3.02% | 0.83% | 0.20% |
| CPI (%) | 3.32% | 1.40% | 2.26% | 1.28% | 3.40% | 1.30% | 1.14% | 3.65% | 1.45% | 1.39% |
| Total N | 341 | | 45 | | 904 | | | 90 | | |

Note:

* indicates the mean difference between adaptively reused religious buildings and religious buildings on the market.

** indicates the mean difference between adaptively reused religious buildings and religious buildings sold to other religious buildings.

On the mean of the total sample, the lot size is approximately 128,000 square feet (approximately 0.003 acres); the floor area ratio is approximately 0.38; the age of properties is approximately 66 years; the distance from the nearest park is 0.86 miles, from the nearest lake is 2.07 miles, and from the nearest highway is 1.69 miles; the percentage change in total population by census tract between 1990 and 2000 is 7.40% and change in the median household income is 42.39%; the unemployment rate is 5.19%; secondary market T-Bill rate is 3.09%; and the percentage change in CPI from a previous year is 3.32%.

The difference in mean of the size of building foot print between adaptively reused religious building and religious buildings on the market is -16.36%, meaning that the footprints of adaptively reused religious buildings are smaller than the building footprint of religious buildings on the market. The difference in mean size of buildings between adaptively reused religious building and religious buildings on the market is approximately 8.22%, meaning that the size of adaptively reused religious buildings are larger than the size of religious buildings on the market. The difference in mean of the lot size between adaptively reused religious building and religious buildings on the market is approximately -24.47%, meaning adaptively reused religious buildings are much smaller in terms of lot than religious buildings on the market. The difference in mean of FAR between adaptively reused religious building and religious buildings on the market is 0.1, meaning that adaptively reused religious buildings have higher FAR than religious buildings on the market. The difference in mean of the number of stories between adaptively reused religious building and religious buildings on the market is 26.44%, indicating adaptively reused religious buildings are higher than religious

buildings on the market. The difference in mean of the property age between adaptively reused religious building and religious buildings on the market is 44.90%, meaning that adaptively reused religious buildings are older than religious building on the market.

In addition to these physical building characteristics, the difference in mean of the distance from the nearest park between adaptively reused religious buildings and religious buildings on the market is -13.23%, from the nearest lake is -22.85%, and from the nearest highway is -10.58%; this indicates that adaptively reused religious buildings are closer to park, lake and highway than religious buildings on the market.

The difference in mean of population change by census tract between adaptively reused religious buildings and religious buildings on the market is -4.32%; the difference in mean of percentage of white population between adaptively reused religious building and religious buildings on the market is 8.36%; the difference in mean of the median household income between adaptively reused religious building and religious buildings on the market is 4.08%; and the difference in mean of percentage of bachelors or high between adaptively reused religious building and religious buildings on the market is -1.00%.

The difference in mean of unemployment rate between adaptively reused religious building and religious buildings on the market is -0.77%, meaning that religious buildings that have been reused in a year show relatively lower unemployment rate. The difference in mean of Treasury bill rate between adaptively reused religious building and religious buildings on the market is 0.36%; and the difference in mean of CPI between adaptively reused religious building and religious buildings on the market is 1.14%.

Table 5-4 shows frequencies of binary independent variables used in this study. 116 religious buildings in the sample have a steeple (34.2% of total), building material of 157 religious buildings is red brick (46.04%) and 50 religious buildings is bluff stone (14.66%). 185 religious buildings are located on major road (54.25% of total) and 209 religious buildings are located in the central cities (61.29%). Of the sample, 43 religious buildings are located in Massachusetts, 33 religious buildings are located in California, 28 religious buildings are located in New York, 26 religious buildings are located in Florida, and 22 religious buildings are located in Texas. The sample includes 62 religious buildings occupied by hierarchical denominations, 11 religious buildings are designated as historic landmarks, and 36 religious buildings are located in national historic districts. The federal historic tax credit was used for 14 reuse projects, the low income housing tax credit were used for 6 reuse projects, and the new market tax credit was used also for 6 reuse projects.

Table 5-4 Frequencies of Binary Variables

| Variable | Total Sample | | On the Market (over 3 year) | | Adaptive Reuse | | Religious Reuse | |
|---|---|---|---|---|---|---|---|---|
| | N | % of Total | N | % of Total | N | % of Total | N | % of Total |
| STEEPLE | 116 | 34.02% | 13 | 28.89% | 83 | 40.69% | 20 | 21.74% |
| BLUFF_STONE | 50 | 14.66% | 5 | 11.11% | 40 | 19.61% | 5 | 5.43% |
| RED_BRICK | 157 | 46.04% | 18 | 40.00% | 102 | 50.00% | 37 | 40.22% |
| MAIN_ST | 185 | 54.25% | 24 | 53.33% | 105 | 51.47% | 18 | 19.57% |
| CENTRALCITY | 209 | 61.29% | 2 | 4.44% | 138 | 67.65% | 41 | 44.57% |
| MA | 43 | 12.61% | 2 | 4.44% | 39 | 19.12% | 2 | 2.17% |
| CA | 33 | 9.68% | 0 | 0.00% | 14 | 6.86% | 19 | 20.65% |
| NY | 28 | 8.21% | 2 | 4.44% | 23 | 11.27% | 3 | 3.26% |
| FL | 26 | 7.62% | 2 | 4.44% | 6 | 2.94% | 18 | 19.57% |
| TX | 22 | 6.45% | 6 | 13.33% | 10 | 4.90% | 6 | 6.52% |
| HIFAITH | 62 | 18.18% | 2 | 4.44% | 46 | 22.55% | 11 | 11.96% |
| HISLNDMARK | 11 | 3.23% | 1 | 2.22% | 10 | 4.90% | 0 | 0.00% |
| HISDISTRICT | 36 | 10.56% | 0 | 0.00% | 33 | 16.18% | 3 | 3.26% |
| HPTC | 14 | 4.11% | 0 | 0.00% | 14 | 6.86% | 0 | 0.00% |
| LIHTC | 6 | 1.76% | 0 | 0.00% | 6 | 2.94% | 0 | 0.00% |
| NMTC | 6 | 1.76% | 0 | 0.00% | 6 | 2.94% | 0 | 0.00% |
| Total N | 341 | | 45 | | 204 | | 92 | |

Table 5-4 also compares percentages of each variable of religious buildings on the market to percentage of each variable of adaptively reused religious buildings. For several variables, huge differences were found: 40.69% of adaptively reused religious buildings have a steeple while only 28.89% of religious buildings on the market have a steeple. 67.65% of adaptively reused religious buildings are located in the central city while only 4.44% of religious buildings on the market are located in the central city. 19.12% of adaptively reused religious buildings are located in Massachusetts while only 4.44% of religious buildings on the market are located in Massachusetts. In addition, 22.55% of adaptively reused religious buildings were run by hierarchical denominations while only 4.44% of religious buildings on the market were run by hierarchical denominations.

Appendix V contains descriptive statistics of continues variables of religious buildings by reuse outcome. It compared descriptive statistics of each outcome. According to Appendix V, retail space and office need smaller building size while school needs larger lot and building size; condominium preferred older properties; and residential rehabilitations including condominiums and low income housing prefer the proximity to parks. Appendix W contains frequency statistics of binary variables of religious buildings by each outcome. According to Appendix W, hierarchical denominations prefer low income housing as reuse plans, but do not prefer retail space; and cultural place prefer religious buildings located in national historic districts or designated as national sacred landmark.

*5.3 Models*

I ran a binary logit model. The binary logit model in this dissertation compared "non-religious reuses," meaning adaptively reused religious buildings, to "religious uses," meaning those religious buildings kept by their original owners or sold to other religious entities. Thus, the dependent variable in this model is a binary variable indicating religious buildings adaptively reused for different purposes (coded as 1) or religious buildings currently reused by religious owners (coded as 0). The reduced form of the equation for the logit model is included in Appendix BB. The purpose of running a binary logit model is to identify factors that affected investment of reuse initiators in general. However results of the binary logit model do not identify factors that affect choices for each outcome. Therefore to test hypotheses a multinomial logit model must be run.

The main hypotheses of this dissertation are tested by multinomial logit models which are a widely used discrete choice model. A discrete choice model[14] predicts a decision made by an individual as a function of any number of variables (Bierlaire, 1997). "An individual" is a decision maker in discrete choice models, and the concept of "an individual" is extended to "a project initiator" in this dissertation because the project initiator decides project outcomes.

The multinomial logit model assumes that distribution of the random error terms is independent and identical over outcome and a category for outcomes is unordered (McFadden, 1973). Choices for a reuse outcome are "undeveloped," "church,"

[14] The multinomial logit model, the ordered logit model and the nested logit model are widely used when a dependent variable is discrete. If a category is ordinal the ordered logit model can be used while the nested logit model is to capture correlations among choices (outcomes).

"condominium," "office," "retail use," "low income housing," "school," and "cultural purpose." These are discrete dependent variables.

*5.3.1 The Multinomial Logit Model*

The multinomial logit model[15] is the most widely used choice model assuming that distribution of the random error terms is independent and identical over alternatives (McFadden, 1973). The multinomial logit regression is appropriate when categories are unordered. This method uses maximum likelihood estimation. When using a multinomial logit model, one outcome of the dependent variable is chosen as the reference category (compare group). The reference category is compared to each outcome category. According to the basic multinomial logit model, assuming the probability that the initiator $n$ chooses $i$ as an outcome can be expressed as an equation (1) (McFadden, 1973):

$$P_n(i) = \frac{ev_{ni}}{\sum_{n=1}^{N} ev_{ni}} \qquad (1)$$

Where, $P_n(i)$ is a probability that initiator $n$ chooses outcome $i$ and $V_{ni}$ is deterministic variables or vectors of outcome $i$ for initiator $n$. In this research, $i$ includes undeveloped, religious purpose, condominium, office, retail, low income

[15] The conceptual framework seems fit for the nested logit model. However, it can not be used in this dissertation since in the nested logit model; the utility function of each outcome is composed of a term of specific to the outcome while in our model the utility function of each outcome is composed of a term of specific to the case (Indiana University, 2010).

housing, school and cultural uses. Therefore, $V_{ni}$ is of the following form:

$$V_{ni} = \alpha_0 + \alpha_1 BLD + \alpha_2 LO + \alpha_3 DM + \alpha_4 MC + \alpha_5 ME + \alpha_6 SEL + \alpha_7 HPL + \alpha_8 TC \quad (2)$$

Where,

| | | |
|---|---|---|
| $BLD$ | = | a vector indicating building characteristics |
| $LO$ | = | a vector indicating location characteristics |
| $DM$ | = | a vector indicating demographic shifts |
| $MC$ | = | a vector indicating local commercial market conditions |
| $ME$ | = | a vector indicating macro economic trends |
| $SEL$ | = | a dummy variable indicating hierarchical sellers |
| $HPL$ | = | a vector indicating historic designation |
| $TC$ | = | a vector indicating tax credits |
| $\alpha_0$ | = | an intercept term for outcome $i$. |
| $\alpha_{1-8}$ | = | estimated logit coefficient for independent variables. |

The model assumes choice *i* among the reuse outcomes, including condominium, office, retail, low income housing, school, cultural use, church to church and undeveloped, is a function of *BLD, LO, DM, MC, SEL, HPL* and *TC*.

*5.3.2 Model Specification*

Hypothesis of this dissertation are tested by a multinomial logit model that is specified into seven sub-models (Appendix X). Model 1 tests the effects of demographic shifts, macro economic conditions and tax credits on outcomes of religious building reuse projects. Model 1 is driven by Phase 1 of the conceptual reuse choice model in

Chapter 4. Model 2 adds a vector of local commercial market conditions, seller's denomination and a vector of historic designation to Model 1. This model is used to figure out marginal effects of local commercial market conditions, seller's denomination and historic designation. Model 2 is driven by Phase 2 of the conceptual reuse choice model. Model 3 adds a vector of location characteristics to Model 2 in order to figure out the marginal effects of location characteristics such as the proximity to the nearest park, lake and highway, and main street or central city locations. Model 4 adds a vector of building characteristics to Model 3. However, because of high correlation among several variables, Model 4 does not include LNBLDSIZE, STEEPLE and RED_BRICK. Therefore Model 5 includes such variables while excluding LNBLDFTPRINT, LNLOTSIZE and BLUFF_STONE. In addition, the multinomial logit model with variables included in Model 4 is run using only religious buildings reused for different purposes since 1990. This is Model 6. It is expected that this model minimizes internal validity threats addressed in the earlier part of this chapter. Another model with variables included in Model 4 is run while using the natural log of actual amount of each tax credit. This is Model 7. The purpose of running Model 7 is to figure out relationships between higher tax credits and choice of each outcome.

In addition to Model 1 to Model 7, I run another multinomial logit model using "retail" as a reference category. The purpose of running this model with "retail" as a reference category is to confirm and compare results obtained by Model 1 to Model 7.

Chapter VI presents empirical findings from the multiple-case study and statistically analyses including findings from correlation analyses, binary logit regression analysis, and multinomial logit regression analyses.

# CHAPTER VI

## ANALYSIS AND DISCUSSION

Chapter VI presents research findings from case studies and statistical analyses. In Chapter III, five successfully reused religious buildings were investigated. A summary of these case studies and their major findings are presented in this chapter. I also tested seven statistical hypotheses. Their results and findings are presented midway through this chapter. In the latter part of this chapter, results of the multinomial logit models are discussed.

Statistical hypotheses were tested by the multinomial logit regression model. A dependant variable for the multinomial logit model was a discrete variable indicating reuse outcomes such as condominium, office, retail space, low income housing, school, cultural center, church to church, and undeveloped.

Office and retail occupancy rates, obtained from CoStar Group by zip code, were

included as independent variables to test the relationship between local commercial market conditions and outcomes of religious building reuse projects. Two dummy variables indicating religious buildings located in a national historic district or religious buildings designated as a national sacred landmark, were included as independent variables to test the relationships between the national historic designations and the outcomes of religious building reuse projects In addition, dummy variables indicating the use of tax credits: including the historic preservation tax credit, the low income housing tax credit and the new market tax credit, were also included as independent variables.

*6.1 Finding from Case Studies*

The Meridian Street Methodist Episcopal Church located in Indianapolis, Indiana has been reused for market rate condominiums. The initial plan for the church was to demolish the original building, but the historic preservation commission of Indiana listed the church as an historic place and encouraged the developer to preserve the original building. The reuse project now comprises 75 condominium units. In addition to historic and architectural significance, location characteristics were an important factor in redeveloping original property.

Originally built in 1915, the Norte Dame Academy in Cleveland, Ohio was converted into a mix of low income and elderly housing. The Famicos Foundation, a non-profit organization that provides housing to Cleveland families, initiated this church and school conversion project in 1999. Because surrounding communities are low income, the conversion to low income housing was a reasonable option. This project

shows an example that both the low income housing tax credit and the historic preservation tax credits were utilized.

The First Church of Christ Scientist in Cleveland, originally built in 1931, was converted into the Nottingham-Spirk Innovation Center. This project took advantage of the new market tax credit: $500,000 was invested by Cleveland Development Advisor (CDA) as a part of the new market tax credit awarded to CDA. The church building now houses over 80 employees. Major exterior features have been preserved.

The Orthodox Jewish congregation Chevra Bikur Cholim in Seattle, WA has been reused as the Langston Hughes Performing Art Center since 1972. The center is connected with the diverse cultures in the community. This project shows how a historic religious building can be utilized in terms of its architectural significances as a cultural center.

From these five cases, we may conclude that historic value and architectural significance, as well as the communities' needs and location factors, influence decisions to initiate the reuse projects. Tax credits including the historic preservation tax credit, the low income housing tax credit and the new market tax credit have played important role in initiators' decision making. Tax credits were not used for condominiums, but were used for income-producing projects in general.

*6.2 Findings from Statistical Analyses*

Prior to running the multinomial logit models, Pearson's correlation and the Phi Correlation were run to detect high correlations (multicolinearity) among independent variables. Based on the results of the correlation analyses, the basic model was specified

into several sub-models. Therefore, the first part of the empirical findings addresses the results of the correlation analyses. After presenting the correlation results, this dissertation presents the results of hypotheses testing; seven comparison tables are presented, followed by the results of other major determinants. The final part presents a summary of results and discussions.

### *6.2.1 Findings from Correlation Analyses*

The Pearson correlation analysis for continuous variables and the phi correlation analysis for binary dummy variables were run to determine high correlations among variables. The Pearson correlation standardizes the two variables when it computes the covariance, while the phi correlation is applied to two binary variables. The purpose of conducting a correlation analysis is to identify a high correlation among independent variables. Appendix Y and Z contain the results of two correlation analyses.

According to the Pearson correlation analysis of continuous variables, the log of building size (LNBLDSIZE) and the log of building foot print (LNBLDFTPRINT) are highly correlated with a coefficient of 0.874, the lot size (LNLOTSIZE) and the floor area ratio (FAR) are negatively correlated with a coefficient of -0.675, the lot size (LNLOTSIZE) and the building size (LNBLDSIZE) are also highly correlated with a coefficient of 0.657, and the floor area ratio (FAR) and the number of stories (STORY) are also highly correlated with a coefficient of 0.437. Based on the Pearson correlation analysis, I found the percentage change of median household income (INCOMECHANGE) and the percentage of owner occupied housing (OWNERCHANGE) with a coefficient of 0.441.

Among binary variables, STEEPLE and BLUFF_STONE are highly correlated with phi coefficient of 0.392, and BLUFF_STONE and RED_BRICK are relatively highly correlated with phi coefficient of -0.376 meaning these two binary dummy variables are negatively related.

*6.2.2 Findings from the Binary Logit Model*

The binary logit model in this dissertation compared "non-religious reuses," meaning adaptively reused religious buildings, to "religious uses," meaning those religious buildings kept by their original owners or sold to other religious entities. Thus, the dependent variable in this model is a binary variable indicating religious buildings adaptively reused for different purposes (coded as 1) or religious buildings currently reused by religious owners (coded as 0). The reduced form of the equation for the logit model was included in Appendix BB. The Pseudo R-Squared of this binary logit model was approximately 0.36.

Appendix AA shows results of the binary logit analysis. LNBLDSIZE was statistically significant at the 99% level with the negative sign indicating that religious buildings with smaller building size are more likely reused for different purposes. AGE was statistically significant at the 95% level with the positive sign meaning that older religious building are more likely reused for different purposes. CENTRALCITY was statistically significant at the 95% level with the positive sign meaning religious buildings located in the central city are more likely reused for different purposes. MA was statistically significant at the 95% level with the positive sign meaning religious buildings located in Massachusetts are more likely reused for different purpose. NY was

statistically significant at the 95% level with the positive sign indicating that religious buildings located in the state of New York are more likely reused for different purposes. POPCHANGE was statistically significant at the 95% level with the negative sign meaning religious buildings located in neighborhoods with lower population growth rates are more likely reused for different purposes. OWNERCHANGE was statistically significant at the 90% level with the positive sign meaning religious buildings located in neighborhoods with higher growth rates of owner occupied housing are more likely reused for different purposes. EDUCHANGE was statistically significant at the 95% level with the negative sign indicating that religious buildings located in neighborhoods with lower rates of higher education levels are more likely reused for different purposes. UNEMPLOYMENT was statistically significant at the 95% level with the negative sign meaning religious buildings placed on the market in a year with higher employment rates are more likely reused for different purposes.

Among building characteristics, smaller building sizes and older ages are positively related to reuse plans. On the other hand, variables of lot size, FAR, stories, bluff stone, and red brick are not associated with reuse plans. Among location characteristics, religious buildings located in the central city, Massachusetts or New York are positively related to reuse plans, but other variables including the proximity to parks, highways and lakes, and the main street locations do not determine reuse plans. Demographic changes are important factors; population growth and higher education are negatively related to reuse plans, but changes of owner occupied housing is positively related to reuse plans. The binary logit model revealed factors that determined reuse plans from religious uses; however, several variables that should have impacts on reuse

plans, such as the main street location, did not determine reuse plans. This may indicate that, even if the main street location is positively related to a certain reuse outcome such as retail space, this result seemed to be offset by results of other outcomes. In order to identify factors that affected each outcome, the multinomial logit model should be used using religious reuse as a reference category and all other outcomes are compared against the reference category.

### *6.2.3 Results from the Multinomial Logit Models: Testing Hypotheses*

In this part, the results of tastings of the main hypotheses are addressed. In the first section in this part, an overview of the models is presented addressing Pseudo R squared in each model. In addition, the second section of this part addresses the main results of hypotheses testing resulted from the multinomial logit models. I ran 7 multinomial logit regression models and each model generates 7 comparisons.

#### *6.2.3.1 Overview of Models*

The main focus of this dissertation is to determine the factors, including national historic designations, local commercial market conditions and tax credits, which affect the outcomes of religious building, reuse projects in the United States. A dependent variable is a discrete variable indicating eight outcomes in this dissertation, and “church to church” cases were set as a reference category meaning this I compared this category to each reuse outcome. In this case the statistical package (STATA) reported seven comparisons: Church to Church and Condominium, Church to Church and Office, Church to Church and Retail Space, Church to Church and Low Income Housing,

Church to Church and School, Church to Church and Cultural Place, and Church to Church and Undeveloped.

Seven different multinomial logit models were run to determine these factors: Model 1 tested the effects of demographic changes and macro economic conditions; Model 2 tested marginal effects of local commercial market condition, seller's denomination and the national historic designations; Model 3 tested marginal effects of location characteristics; Model 4 and Model 5 tested marginal effects of building characteristics; Model 6 included the same independent variables as Model 4, but excluded religious buildings redeveloped before 1990; and Model 7 also used continuous variables for the three tax credits. Pseudo R squared of Model 1 was 0.15, Model 2 was 0.20, Model 3 was 0.34, Model 4 was 0.44, Model 5 was 0.41, Model 6 was 0.45 and Model 7 was 0.42 Table 7-1 and tables CC through HH in Appendix includes Pseudo R Squared and Log likelihood values.

*6.2.3.2 "Church to Church" and "Condominium"*

Table 6-1 shows a comparison of "church to church" with condominium. According to the results of Model 7, HISDISTRICT was statistically significant at the 99% level with positive sign, meaning if religious buildings are located within national historic districts, such religious buildings are more likely to be reused for condominiums than sold as churches. This result was confirmed to other models testing the effects of HISDISTRICT. HISDISTRICT in other models was statistically significant at the 99% level. Therefore a null hypothesis of $H_{1-1}$ is rejected.

On the other hand, HISLNDMARK in each model was not statistically significant at the 95% level meaning the national designation of sacred landmark has no impact on the choice of condominiums as an outcome of religious building reuse projects. Therefore a null hypothesis of $H_{2-1}$ cannot be rejected.

According to the results of each model, RETAIL and OFFICE were not statistically significant, meaning local retail and office occupancy rates have no impact on the choice of condominiums. Therefore null hypotheses of $H_{3-1}$ and $H_{4-1}$ cannot be rejected.

Table 6-1 Results of Multinomial Logit Model 1, “Church to Church” and Condominium

| Independent Variables | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | | Model 6 | | Model 7 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value |
| ***Building Characteristics*** | | | | | | | | | | | | | | |
| LNBLDFTPRINT | | | | | | | 0.79 | 1.39 | | | 0.70 | 1.20 | 0.79 | 1.39 |
| LNBLDSIZE | | | | | | | | | -0.46 | -1.68* | | | | |
| LNLOTSIZE | | | | | | | -1.20 | -2.32** | | | -1.08 | -2.04** | -1.20 | -2.32** |
| FAR | | | | | | | -1.37 | -0.76 | 1.95 | 1.80* | -0.33 | -0.17 | -1.37 | -0.76 |
| STORY | | | | | | | 0.24 | 0.78 | 0.45 | 1.39 | 0.11 | 0.35 | 0.24 | 0.78 |
| AGE | | | | | | | 0.02 | 2.07* | 0.02 | 2.17** | 0.02 | 1.90* | 0.02 | 2.07** |
| STEEPLE | | | | | | | | | 0.00 | 0.00 | | | | |
| BLUFF_STONE | | | | | | | 0.50 | 0.60 | | | 0.71 | 0.80 | 0.50 | 0.60 |
| RED_BRICK | | | | | | | 0.42 | 0.74 | | | 0.48 | 0.84 | 0.42 | 0.74 |
| ***Location Characteristics*** | | | | | | | | | | | | | | |
| PARK | | | | | -0.23 | -0.68 | -0.09 | -0.31 | -0.10 | -0.28 | -0.10 | -0.34 | -0.09 | -0.31 |
| LAKE | | | | | 0.00 | -0.04 | 0.06 | 0.69 | 0.02 | 0.18 | 0.05 | 0.58 | 0.06 | 0.69 |
| HIGHWAY | | | | | 0.21 | 2.31** | 0.34 | 3.06*** | 0.29 | 2.64*** | 0.33 | 3.00*** | 0.34 | 3.06*** |
| MAIN_ST | | | | | -0.87 | -2.01** | -0.46 | -0.94 | -0.54 | -1.14 | -0.32 | -0.63 | -0.46 | -0.94 |
| CENTRALCITY | | | | | 1.41 | 2.96*** | 1.02 | 1.89* | 1.18 | 2.26** | 1.04 | 1.89* | 1.02 | 1.89* |
| MA | | | | | 3.26 | 3.71*** | 2.51 | 2.54** | 2.45 | 2.51** | 2.37 | 2.34** | 2.51 | 2.54*** |
| CA | | | | | -0.44 | -0.63 | -0.63 | -0.82 | -0.38 | -0.50 | -0.58 | -0.74 | -0.63 | -0.82 |
| NY | | | | | 2.35 | 2.81*** | 1.58 | 1.75* | 1.80 | 1.99** | 1.72 | 1.86* | 1.58 | 1.75* |
| FL | | | | | -37.15 | 0.00 | -44.81 | . | -36.93 | 0.00 | -36.06 | 0.00 | -44.81 | . |
| TX | | | | | -0.33 | -0.34 | 0.28 | 0.27 | 0.26 | 0.25 | 0.37 | 0.35 | 0.28 | 0.27 |
| ***Demographic Sifts*** | | | | | | | | | | | | | | |
| POPCHANGE | -2.33 | -2.02** | -2.69 | -2.14** | -1.67 | -1.14 | -0.28 | -0.19 | -0.54 | -0.36 | -0.46 | -0.32 | -0.28 | -0.19 |
| INCOMECHANGE | 0.73 | 0.77 | 0.75 | 0.75 | 0.84 | 0.75 | 0.14 | 0.11 | 0.35 | 0.29 | 0.26 | 0.21 | 0.14 | 0.11 |
| OWNERCHANGE | 3.61 | 0.76 | 6.45 | 1.26 | 4.78 | 0.78 | 5.60 | 0.81 | 5.15 | 0.76 | 3.64 | 0.53 | 5.60 | 0.81 |

| Independent Variables | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | | Model 6 | | Model 7 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | | Coef. | z-value | Coef. | z-value | Coef. | z-value |
| EDUCHANGE | -1.49 | -1.28 | -1.59 | -1.31 | -1.26 | -0.88 | -0.40 | -0.26 | -0.98 | -0.62 | | | | |
| ***Commercial Market*** | | | | | | | | | | | | | | |
| RETAIL | | | -0.94 | -1.04 | -0.58 | -0.55 | -0.50 | -0.42 | -0.56 | -0.49 | -0.31 | -0.25 | -0.50 | -0.42 |
| OFFICE | | | 2.47 | 0.51 | 3.47 | 0.64 | 4.24 | 0.75 | 3.25 | 0.58 | 6.50 | 1.14 | 4.24 | 0.75 |
| ***Macro Economic*** | | | | | | | | | | | | | | |
| UNEMPLOYMENT | -69.02 | -2.37** | -75.41 | -2.53** | -101.95 | -2.91*** | -108.41 | -2.85*** | -105.41 | -2.90*** | -175.15 | -3.26*** | -108.42 | -2.85*** |
| TBILL | -9.32 | -0.52 | -16.00 | -0.87 | -33.59 | -1.54 | -34.56 | -1.44 | -37.79 | -1.64 | -57.78 | -2.01** | -34.56 | -1.44 |
| ***Sellers' Denomination*** | | | | | | | | | | | | | | |
| HIFAITH | | | 1.04 | 2.16** | 0.64 | 1.15 | 0.48 | 0.77 | 0.43 | 0.71 | 0.55 | 0.87 | 0.48 | 0.77 |
| ***Historic Designation*** | | | | | | | | | | | | | | |
| HISLNDMARK | | | 2.22 | 1.62 | 2.29 | 1.58 | 0.97 | 0.64 | 1.02 | 0.66 | -0.69 | -0.46 | 0.97 | 0.64 |
| HISDISTRICT | | | 24.94 | 18.28*** | 22.87 | 15.40*** | 22.12 | 13.02*** | 21.93 | 13.48*** | 22.09 | 12.76*** | 22.13 | 13.03*** |
| ***Tax Credits*** | | | | | | | | | | | | | | |
| HPTC | -9.84 | 0.00 | -13.51 | 0.00 | -15.65 | 0.00 | -23.36 | . | -15.79 | 0.00 | -14.16 | 0.00 | -0.10 | -0.33 |
| LIHTC | -3.38 | 0.00 | -10.60 | . | -10.86 | . | -5.23 | . | -3.49 | . | -4.61 | . | 0.02 | . |
| NMTC | -12.91 | 0.00 | -15.36 | 0.00 | -18.78 | . | -18.98 | . | -17.34 | 0.00 | -19.73 | . | 0.10 | . |
| Log Likelihood | | -580.78 | | -543.40 | | -456.56 | | -388.02 | | -404.50 | | -370.84 | | -388.00 |
| Pseudo R Squared | | 0.15 | | 0.20 | | 0.33 | | 0.43 | | 0.40 | | 0.44 | | 0.43 |

Note:

1. *, ** and *** denotes statistical significance at the 90%, 95% and 99% level of confidence, respectively.
2. Observations of Model 1 to Model 5 are 341. Theses models include all observations in the sample
3. Observations of Model 6 are 289. Model 6 only includes religious buildings which were redeveloped after 1990.
4. Tax credit variables – HPTC LIHTC NMTC – in Model 1 to Model are dummy variables indicating uses of tax credits, but in Model 7, logged the actual dollar amounts that were put for the project.

*6.2.3.3 "Church to Church" and "Office"*

Having 6-1 as a table of results for condominium, I now briefly discuss only results of offices. Appendix CC shows the comparison of church to church with office. According to the results in Model 5, HISDISTRICT was statistically significant at the 99% level with the positive sign meaning religious buildings located in a national historic district, are more likely to be reused for offices than churches. This result was confirmed by Model 3 since HISDISTRICT in Model 3 was also statistically significant at the 99% level. Therefore a null hypothesis of $H_{1-2}$ is rejected.

On the other hand, HISLNDMARKs in each model were not statistically significant at the 99% level, meaning the national designation of sacred landmark has no impact on the choice of offices as a reuse outcome. Therefore a null hypothesis of $H_{2-2}$ cannot be rejected.

According to the results of each model, RETAIL and OFFICE were not statistically significant meaning local retail and office occupancy rates have no impact on the choice of offices as reuse outcomes. Therefore a null hypotheses of $H_{3-2}$ and $H_{4-2}$ cannot be rejected.

According to the results of Model 7, HPTC was statistically significant at the 99% level with the positive sign, meaning that historic preservation tax credits have been positively associated with when religious buildings were converted into office space. This result was confirmed with other models also showing a very high significance. Therefore a null hypothesis of $H_{5-1}$ is rejected. On the other hand, because I assumed the positive relationship between NMTC and offices as a reuse outcome, a

null hypothesis of $H_{7-1}$ cannot be rejected.

*6.2.3.4 "Church to Church" and "Retail Space"*

Appendix DD contains comparisons of church to church to retail outcomes. According to the results of Model 7, HISDISTRICT was statistically significant at the 99% level with the positive sign meaning if religious buildings are located in national historic districts, such religious buildings are more likely reused for retail space rather than churches. This result is confirmed by other models with high significances. Therefore a null hypothesis of $H_{1-3}$ is rejected.

On the other hand, HISLNDMARK was not statistically significant in the models, meaning the national designation of sacred landmark has no impact on the choice of retail space as a reuse outcome. Therefore a null hypothesis of $H_{2-3}$ cannot be rejected.

OFFICE was statistically significant at the 90% level in Model 7 with the positive sign meaning if religious buildings are located in neighborhoods with higher office occupancy rates, such religious buildings are more likely to be reused for retail spaces rather than churches. This result is confirmed by Model 4 and Model 5. Therefore, a null hypothesis of $H_{3-3}$ is rejected. On the other hand, RETAIL was not statistically significant in models, meaning the retail occupancy rate has no impact on retail reuse of religious buildings. Therefore a null hypothesis of $H_{4-3}$ cannot be rejected.

HPTC was statistically significant at the 99% level with the positive sign in each model meaning when developers converted religious buildings into retail space, historic preservation tax credits were likely associated with the project. Therefore a null

hypothesis of $H_{5-2}$ is rejected. In addition, in each model NMTC was statistically significant at the 99% level with the positive sign meaning when developers converted religious buildings into retail spaces, the new market tax credits were likely associated with the project. Therefore a null hypothesis of $H_{7-2}$ is rejected.

*6.2.3.5 "Church to Church" and "Low Income Housing"*

Appendix EE contains comparisons of church to church with low income housing. According to results of each model, both HISLNDMARK and HISDISTRICT were not statistically significant, meaning, there are no relationships between national historic designations and choices of low income housing as an outcome of religious building reuse projects. Therefore a null hypotheses of $H_{1-4}$ and $H_{2-4}$ cannot be rejected.

RETAIL and OFFICE were not statistically significant in each model; meaning conversions of religious buildings into low income housing are not affected by local retail and office occupancy rates. Therefore a null hypotheses of $H_{3-4}$ and $H_{4-4}$ cannot be rejected.

According to the result of Model 7, LIHTC was statistically significant at the 99% level with the positive sign meaning that low income housing tax credits were likely associated with the project. This result is confirmed by other models. Therefore a null hypothesis of $H_{6-1}$ is rejected.

*6.2.3.6 "Church to Church" and "School"*

Appendix FF delivers comparisons of "church to church" with "school." According to the results of models, both HISLNDMARK and HISDISTRICT were not statistically significant, meaning national historic designations have no impact on "school" as a reuse outcome. Therefore null hypotheses of $H_{1-5}$ and $H_{2-5}$ cannot be rejected.

In addition, both RETAIL and OFFICE were not statistically significant, meaning Commercial Market conditions are not related to "school" as a reuse outcome. Therefore a null hypotheses of $H_{3-5}$ and $H_{4-5}$ cannot be rejected.

*6.2.3.7 "Church to Church" and "Cultural Place"*

Appendix GG shows comparisons of "church to church" with "cultural." According to the results of Model 7, HISLNDMARK was statistically significant at the 90% level, with the positive sign meaning, if religious buildings were designated as national sacred landmarks, such religious buildings are more likely reused for cultural places rather than churches. This result is confirmed by other models. Therefore a null hypothesis of $H_{1-6}$ is rejected. In addition, HISDISTRICT was statistically significant at the 99% level, with the positive sign meaning, if religious buildings are located in a national historic district, such religious buildings are more likely reused for cultural places rather than churches. This result is confirmed by other models. Therefore a null hypothesis of $H_{2-6}$ is rejected.

According to the result of Model 7, OFFICE was statistically significant at the

90% level, with the positive sign meaning, if religious buildings are located in neighborhoods with higher office occupancy rates, such religious buildings are more likely reused for cultural places rather than churches. This result is confirmed by Model 1, Model 4, Model 5 and Model 6. Therefore a null hypothesis of $H_{3-6}$ is rejected.

### *6.2.4 Other Determinants*

Empirical findings of other determinants are addressed in this section. This section also presents comparisons of "church to church" with each outcome.

#### *6.2.4.1 "Church to Church" and "Condominium"* (Table 7-1)

In terms of building characteristics, the building size, the lot size and age of the property are significantly related to condominiums as an outcome of religious building reuse projects. According to Model 5, LNBLDSIZE was statistically significant at the 90% level, with the negative sign meaning religious buildings with smaller building sizes are more likely to be reused for condominiums. In addition, LNLOTSIZE is statistically significant at the 95% level with the negative sign in Model 4, Model 6 and Model 7 meaning the lot size is negatively related to condominiums. Overall, it is concluded that smaller religious buildings with smaller lots tend to be invested in by condominium developers. Condominium developers may need more spaces within and outside of the building to build more units and parking spaces. The results indicate that religious buildings with smaller sizes are likely reused for condominiums, this was induced because religious buildings compared to religious buildings that are still used

for churches.

According to the results of Model 7, LNLOTSIZE was statistically significant at the 95% level, with the negative sign meaning religious buildings with smaller lot size are more likely reused for condominiums compared to churches. This result is confirmed by Model 5. AGE was statistically significant at the 90% level, with the positive sign meaning older religious buildings are more likely to be reused for condominiums compared to churches. This result is confirmed by other models.

According to the results of Model 7, HIGHWAY was statistically significant at the 99% level, with the positive sign meaning the proximity to a highway is negatively related to condominiums as a reuse outcome. This result is confirmed by Model 3, Model 4, Model 5 and Model 6. MAIN_ST was statistically significant at the 95% level, with the negative sign meaning religious buildings located on major streets are more likely reused for churches compared to condominiums. Although other models do not confirm this result, signs of coefficients are constant over models. Thus, it is concluded that, a main street location is negatively related to condominiums. According to Model 7, CENTRALCITY was statistically significant at the 90% level, with the positive sign meaning religious buildings located in the central city are more likely reused for condominiums compared to churches, and this result is confirmed by other models; MA was statistically significant at the 99% level, with the positive sign meaning religious buildings locate in the state of Massachusetts are more likely to be reused for condominiums compared to churches. This result is also confirmed by other models. NY was also statistically significant at the 90% level, with the positive sing meaning religious buildings located in the state of New York are more likely reused for

condominiums compared to churches. This result is confirmed by other models.

According to the results of Model 1, POPCHANGE was statistically significant at the 95% level, with the negative sign meaning religious buildings located in neighborhoods with higher population growth rates are more likely to be reused for churches rather than condominiums. This result is confirmed by Model 2, but POPCHANGE was not statistically significant in Model 3 to Model 7. However, the sings of coefficients of POPCHANGE are constant over models. Thus, it is concluded that, POPCHANGE is negatively related to conversions of religious buildings into condominiums, but the effects are not strong.

According to Model 7, UNEMPLOYMENT was statistically significant at the 99% level, with the negative sign meaning religious buildings placed on the market in years with lower unemployment rates are more likely reused for condominiums, rather than churches, this result is confirmed by other models.

*6.2.4.2 "Church to Church" and "Office"* (Appendix CC)

According to Model 7, LNBLDFTPRINT was statistically significant at the 99% level, with the negative sign meaning religious buildings with smaller building footprint are more likely to be reused for offices compared to churches. This result is confirmed by other Models that tested the effects of LNBLDFTPRINT.

According to Model 7, PARK was statistically significant at the 99% level, with the positive sign meaning proximity to the nearest park is negatively related to office as a reuse outcome. This result is confirmed by other models that tested effects of PARK; CENTRALCITY was statistically significant at the 95% level, with the positive sign

meaning religious buildings located in central cities are more likely to be reused for offices compared to churches. This result is confirmed by other models that tested the effects of CENTRALCITY. MA was statistically significant at the 95% level with the positive sign meaning religious buildings located in the state of Massachusetts are more likely reused for offices compared to churches. This result is confirmed by Model 3, Model 4 and Model 6. In addition, according to Model 3, FL was statistically significant at the 95% level with the negative sign meaning religious buildings located in Florida are more likely to be reused for churches compared to offices. This result is not confirmed by other models that tested the, effects of FL. However sings of its coefficients are constant over the models and it is statistically significant at the 85% level. Thus, the effects of FL cannot be ignored.

According to the results of Model 1, Model 2 and Model 3, POPCHANGE was statistically significant at the 90% level with the negative sign meaning religious buildings in neighborhoods with greater population growth are more likely to be reused for churches compared to offices. Although Model 4, Model 5 and Model 6 do not report statistical significances, population change seems to have an impact on choice of offices as a reuse outcome, because the sings were constant over models and it was statistically significant at the 85% level in other models.

According to Model 5 and Model 6, UNEMPLOYMENT was statistically significant at the 90% level with the negative sign meaning religious buildings placed on the market in a year with lower unemployment rates are more likely to be reused for offices compared to churches. Although this result is not confirmed by other models that tested effects of UNEMPLOYMENT, its effects cannot be ignored because its signs are

constant over models and was significant at the 85% level.

According to Model 1, HIFAITH was statistically significant at the 95% level with the positive sign meaning religious buildings, which were occupied by hierarchical denominations, were more likely reused for offices compared to churches. However, this result was not confirmed by other models, though its effects cannot be ignored as signs were constant over models and it was statistically significant at the 85% level.

*6.2.4.3 "Church to Church" and "Retail"* (Appendix DD)

According to Model 7, LNBLDFTPRINT was statistically significant at the 95% level with the negative sign meaning religious buildings with smaller building footprints are more likely to be reused for retail space. This result is confirmed by other models that tested effects of LNBLDFTPRINT; FAR was statistically significant at the 90% level with the positive sign meaning religious buildings with more parking spaces are more likely to be reused for retail space compared to churches. This result is confirmed by other models; and STORY was statistically significant at the 90% level with the negative sign meaning religious buildings with fewer stories are more likely to be reused for retail places compared to churches, this result is confirmed by other models. According to Model 5, LNBLDSIZE was statistically significant at the 99% level with the negative sign meaning religious buildings with smaller building size are more likely to be reused for retail places when compared to churches.

According to a result of Model 7, PARK was statistically significant at the 95% level with the positive sign meaning proximity to parks is negatively related to retail reuse. This result is confirmed by other models that tested the effects of PARK;

CENTRALCITY was statistically significant at the 90% level with the positive sign meaning religious buildings located in the central city are more likely to be reused for retail space when compared to churches. This result is confirmed by other models; and CA was statistically significant at the 95% level with the negative sign meaning religious buildings located in California are more likely to be reused for churches when compared to retail places. This result is confirmed by other models that tested the effects of CA.

According to a result of Model 1, POPCHANGE was statistically significant at the 90% level with the negative sign meaning religious buildings located in neighborhoods with greater population growth are more likely to be reused for churches when compared to retail space. This result is confirmed by Model 2 and Model 3. Although it is not confirmed by Model 4 to Model 7, it seems POPCHANGE has an impact on retail as a reuse outcome because its signs were constant in models and it was statistically significant at the 85% level in other models; and EDUCHANGE was statistically significant with the negative sign meaning religious buildings located in neighborhoods with more educated people are more likely to be reused for churches when compared to retail space. According to Model 7, OWNERCHANGE was statistically significant at the 95% level with the positive sign meaning religious buildings located in neighborhoods with more owners are more likely to be reused for retail space when compared to churches. This result is confirmed by other models that tested the effects of OWNERCHANGE.

Interestingly, according to Model 7, OFFICE was statistically significant at the 90% level with the positive sign meaning religious buildings located in neighborhoods

with higher office occupancy rates are more likely to be reused for retail space when compared to churches. This result is confirmed by other models that tested the effects of OFFICE on the choice of reuse outcomes.

According to Model 7, TBILL was statistically significant at the 95% level with the negative sign meaning religious buildings placed on the market in a year with lower Treasury Bill rates are more likely to be reused for retail spaces when compared to churches.

*6.2.4.4 "Church to Church" and "Low Income Housing"* (Appendix EE)

According to Model 6, FAR was statistically significant at the 90% level with the positive sign meaning religious buildings with higher floor area ratios are more likely reused for low income housing. However, this result was not confirmed by other models that tested the effects of FAR; and BLUFF_STONE and RED_BRICK were statistically significant at the 99% level with the positive signs - and these results were confirmed by Model 6 and Model 7 - meaning religious buildings made up with bluff stone or red brick are more likely to be reused for low income housing when compared to churches.

According to Model 7, MA was statistically significant at the 95% level with the positive sign meaning religious building located in Massachusetts are more likely to be reused for low income housing when compared to churches, this result is confirmed by other models that tested effects of MA on low income housing as a reuse outcome.

According to a result of Model 1, POPCHANGE was statistically significant at the 90% level with the negative sing meaning religious buildings located in

neighborhoods with greater population growth are more likely to be reused for churches when compared to low income housing. Although POPCHANGE was not confirmed by other models, it seems there are effects of POPCHANGE because it was statistically significant at the 85% level and its signs are constant over models.

According to Model 7, TBILL was statistically significant at the 99% level with the negative sign meaning religious buildings placed on the market in a year with lower Treasury Bill rates are more likely to be reused for low income housing when compared to churches. This result is confirmed by other models.

According to Model 2, HIFAITH was statistically significant at the 95% level with the positive sign meaning religious buildings sold to hierarchical denominations are more likely to be reused for low income housing when compared to churches. Although other models do not confirm this result, signs are constant over models and it was statistically significant at the 85% level.

*6.2.4.5 "Church to Church" and "School"* (Appendix FF)

According to Model 7, LNBLDFTPRINT was statistically significant at the 90% level with the negative sign meaning religious buildings with smaller building footprints are more likely to be reused for schools when compared to churches. This result was confirmed by other models that tested effects of LNBLDFTPRINT; LNLOTSIZE was statistically significant at the 95% level with the positive sign meaning religious buildings with larger lot sizes are more likely to be reused for schools when compared to churches. These results are confirmed by Model 5 and Model 6 with FAR statistically significant at the 95% level with the positive sign meaning religious buildings with

higher floor area ratios are more likely to be reused for schools when compared to churches. This result was confirmed by other models.

According to Model 7, PARK was statistically significant at the 99% level with the negative sign meaning park proximity is positively related to school as a reuse outcome when compared to churches. This result was confirmed by other models

According to Model 1, POPCHANGE was statistically significant at the 90% level with the negative sign meaning population growth is negatively related to schools as a reuse outcome, this result was confirmed by Model 2 and Model 6. According to Model 7, OWNERCHANGE was statistically significant at the 95% level with the positive sign meaning religious buildings located in neighborhoods with lower owner occupied housing are more likely to be reused for schools when compared to churches; and EDUCHANGE was statistically significant at the 99% level with the negative sign meaning higher education is negatively related to schools, this result was confirmed by other models that tested effects of EDUCHANGE.

According to Model 7, UNEMPLOYMENT was statistically significant at the 90% level with the negative sign meaning religious buildings placed on the market in years with lower unemployment rates are more likely to be reused for schools when compared to churches. This result was confirmed by Model 6 and Model 4; and TBILL was statistically significant at the 90% level with the negative sign. The results from Model 1 are confirmed by other models that tested effects of TBILL.

*6.2.4.6 "Church to Church" and "Cultural Place"* (Appendix GG)

According to Model 7, AGE was statistically significant at the 95% level with

the positive sign meaning older religious buildings tend to be reused for cultural places when compared to churches, this result is confirmed by Model 5 and Model 6.

According to Model 7, CENTRALCITY was statistically significant at the 90% level with the positive sign meaning religious buildings located in the central city are more likely to be reused for the cultural places when compared to churches, this result is confirmed by other models that tested the effects of CENTRALCITY; and CA was statistically significant at the 95% level with the negative sign meaning religious buildings located in California are more likely to be reused for churches when compared to cultural places. According to Model 3, MA was statistically significant at the 95% level with the positive sign meaning religious buildings located in Massachusetts are more likely to be reused for cultural places. Although this result is not confirmed by other models, it seems there are effects of MA because signs of coefficients are constant over models and it was statistically significant at the 85% level.

According to a result of Model 1, POPCHANGE was statistically significant at the 90% level with the negative sign, this result is confirmed by Model 2 meaning population growth is negatively related to cultural places when compared to churches. In addition, according to Model 7, OWNERCHANGE was statistically significant at the 95% level with the positive sign, this result is confirmed by other models meaning owner occupied housing rates are positively related to cultural places when compared to churches.

According to Model 7, OFFICE was statistically significant at the 90% level with the positive sign meaning religious buildings located in neighborhoods with higher office occupancy rates are more likely to be reused for cultural places when compared to

churches. This result was confirmed by other models that tested effects of OFFICE.

According to Model 7, UNEMPLOYMENT and TBILL were statistically significant at the 95% level and at the 99% level, respectively with the negative signs, and those results are confirmed by other models meaning religious buildings placed on the market in years with lower unemployment and Treasury bill rates are more likely to be reused for cultural places.

*6.2.4.7 "Church to Church" and "Undeveloped"* (Appendix HH)

According to Model 7, LNBLDFTPRINT was statistically significant at the 95% level with the positive sign meaning religious buildings with larger building footprints are more likely to be undeveloped, this result was confirmed by other models that tested the effects of LNBLDFTPRINT; LNLOTSIZE was statistically significant at the 99% level with the negative sign meaning religious buildings with smaller lot sizes tend to be undeveloped, this result is confirmed by other models.

According to Model 3, CENTRALCITY was statistically significant at the 90% level with the positive sign meaning religious buildings in the central city are more likely to be undeveloped when compared to reuse as churches. Although this result is not confirmed by other models it seems there are effects of CENTRALCITY because its signs are constant over models and its effects are statistically significant at the 85% level. In addition, according to Model 7, HIGHWAY was statistically significant at the 90% level with the positive sign meaning religious buildings farther from the highway are more likely to be undeveloped, this result is confirmed by other models; and FL was statistically significant at the 90% level with the negative sign meaning religious

buildings located in Florida are more likely to be reused for churches, this result is confirmed by other models.

*6.3 Summary of Empirical Findings and Discussion*

Using the multinomial logit regressions, this dissertation has determined factors that affect choices in the outcomes of religious building reuse projects. Religious buildings sold to other religious entities - assuming those religious buildings are currently reused for worship places – churches – were set as a reference category. This dissertation compared this reference outcome to each outcome including: condominium, office, retail space, low income housing, school, cultural place and undeveloped religious building.

Table 6-2 shows results the multinomial logit regression results of Model 7. For LNBLDSIZE and STEEPLE, the results of Model 6 were reported in Table 7-2 because Model 7 does not include such variables.

The size of the building and the lot always matters. To redevelop religious buildings for offices or retail spaces, smaller religious buildings – smaller building footprint and smaller building size – are preferred. If the spaces on the properties are too large, it is not suitable to redevelop as office and retail spaces. In terms of building size, smaller building sizes are preferred in redeveloping religious buildings as condominiums. This is an interesting finding, as condominium redevelopment usually needs larger space on the property. It seems that it is because condominiums are compared to religious reuses meaning churches may need more spaces than condominiums. Lot size negatively matters for condominiums, but positively matters for schools. This seems reasonable

because schools require a playground. FAR matters for retail spaces and schools. FAR is a proxy of parking spaces. Thus retail spaces and schools may need more parking spaces. The age of properties also matters. Condominiums and cultural places tend to be redeveloped in older religious buildings. Older ages seems proxies of historic values of properties. Thus it has been preferred by condominium developers, or initiators of cultural spaces. The steeple matters for retail spaces and low income housing. The steeple is used to define sacred places. I assume that retail developers prefer religious buildings with a steeple.

Park proximity is not preferred by commercial redevelopment. This result is reasonable because population density is too low near parks to get enough buying power. However park proximity is preferred by school initiators. They may utilize space in the park as their play ground. Proximity to highways is not preferred by condominiums. This result indicates that negative amenities generated by the highway negatively affect residential purposes. This result confirms Simons and Choi's (Forthcoming) previous result. Central city locations always matter. This result reflects that religious buildings located in suburban or exurban areas tend to be reused for churches, but religious buildings located in central cities tend to be placed on the market and tend to be redeveloped for different purposes rather than churches. In other words, this result indicates the effects of suburbanization on the religious landscape in the central cities. Locations in Massachusetts matter for condominiums, offices and low income housing. Overall religious buildings in MA tend to be redeveloped for residential purposes. Religious buildings in the state of New York also tend to be redeveloped for residential purposes. These results may reflect the internal validity threats generated from selection

bias of the sample. Many of the religious buildings that are adaptively reused for different purpose were located in Eastern states including Massachusetts and New York. On the other hand, religious buildings sold to other religious organizations were from the Western states.

Although population change was not statistically significant in Model 7, it was found that population change matters, somewhat, for choices of reuse outcomes because Model 1 to Model 3 reported a significant relationship between population change and reuse outcomes. In general, if population is growing, religious buildings tend to be sold for churches, while, if population is decreasing, religious buildings provide redevelopment opportunities. This result also reflects the effects of suburbanization on religious landscapes in neighborhoods with loss of population. A high percentage of owner occupied housing matters for retail spaces, schools and cultural places. A higher percentage of owner occupied housing is a proxy of single family neighborhoods. Thus community members in such neighborhoods do not prefer multifamily homes, while they will prefer what they can enjoy. As a result, it seems that retail spaces, schools and cultural places are positively related to a higher percentage of owner occupied housing.

Office occupation rates in neighborhoods matter for retail and cultural places. It seems that higher densities of offices and higher rents of office spaces generate market demands for retail spaces. In addition, workers in such office buildings may need more cultural spaces that they can enjoy.

Unemployment rates matter for condominiums, schools and cultural places. In addition, Treasury bill rates matter for all reuse plans; except offices and condominiums. Based on these results, although reuse plans are non-profit purposes, bad macro

economic conditions may affect the frequency in which reuse initiators invest money on uncertain projects.

The location of national historic districts matters for condominiums, retail spaces, and cultural centers. If religious buildings are located in national historic districts, owners or developers may have advantages in obtaining financial support from the federal or local governments. In addition, initiators of religious building reuse projects in historic districts may consider that they can get more financial benefits through such projects because properties are located more viable historic communities. If religious buildings were designated as national sacred landmarks, such properties tend to be redeveloped as cultural places. The national sacred landmark is a proxy of historic value and architectural significance of the property. Thus it is reasonable that cultural places with more historic and architectural features are preferred by initiators.

Historic preservation tax credits have been positively associated with reuse projects of religious buildings when religious buildings are converted into offices, retail spaces or low income housing. This result indicates the impact that federal subsidies on historic preservation have played in, not only preserving historic structures, but also boosting the local economy. The assumption is made that federal funds that have input to such projects may generate positive externalities through job creation, improved infrastructure and a boost in tourism. In addition, it is highlighted that historic preservation tax credits have been positively associated with low income housing projects. Public planners who would like to serve low income communities can utilize this tax credit in the rehabilitation of religious buildings. The Low Income Housing Tax Credit (LIHTC) has been associated with the conversion of religious buildings into low

income rental housing. This result indicates that the LIHTC has served low income communities effectively. New market tax credits have been positively associated with reuse projects of religious buildings when initiators reused the properties for retail spaces, there is no evidence that this credit has been used for offices.

*6.4 Discussion on Odds Ratios of Parameter Estimations*

Odds in the multinomial logit models represent the probability of belonging to one alternative (one reuse outcome in this dissertation) divided by the probability of not belonging to that alternative (reuse outcome). Obtaining the odds ratio is one of the important objectives in logit models. The odds ratio is a ratio of the odds for each outcome (Meyers, Gamst and Guarino, 2005).

The multinomial logit models in this dissertation tested whether or not internal and external factors including tax credits in this dissertation are determinants of a choice of a reuse outcome. Basically, the multinomial logit models compared effects of variables on choosing "Church to Church" to effects of variables on choosing each outcome. Table 6-2 shows coefficients with odds ratio (in parentheses). Table 6-2 summarized results obtained by Model 7 and Model 5.

The size of building footprint is negatively related to office, retail and school. Retail shows larger odds ratio with negative 7.81 followed by office (-3.50) and school (-2.42). This result indicates that a decrease of 1%[16] on the size of building footprint increases the odds of choosing retail by 7.81 times, choosing office by 3.5 times and choosing school by 2.42 times compared to "church to church" controlling for all other

[16] If certain variables were logged, I should interpret as % changes.

variables. Thus I should conclude that retail as a reuse outcome is most likely to be the highest and best use, holding all else constant,  for redundant religious buildings with smaller building footprint because the probability choosing retail is 2 times higher than choosing office.

Building size is negatively related to condominium, office and retail. Office shows larger odds ratio with negative 0.60 followed by condominium (0.04) and retail (0.02). This result indicates that a decrease of 1% on the building size increases the odds of choosing office by 0.6 times, choosing condominium by 0.04 times and choosing retail by 0.02 times compared to “church to church” holding all else constant. Thus I should conclude that office as a reuse outcome is the highest and best use for redundant religious buildings with smaller building size.

Lot size is negatively related to condominium while positively related to school. Condominium shows odds ratio with negative 0.25 indicating that a decrease of 1% on the lot size increases the odds of choosing condominium by 0.25 times compared to church to church reuses. School shows odds ratio with positive 5.20 meaning that an increase of 1% on the lot size increases the odds for choosing school by 5.2 times compared to church to church reuses, holding all else constant.

Floor area ratio is positively related to retail and school indicating such reuse outcomes need more parking spaces or play grounds. Retail shows a positive 85.41 odds ratio meaning that an increase of 0.1% on floor area ratio increases the odds of choosing retail by 8.54 times compared to church to church reuse, holding all else constant. School shows a 9.6 odds ratio meaning that an increase of 0.1% on floor area ratio increases the odds of choosing school by 9.6 times compared to church to church

controlling or all other variables. School has 12% higher probability than retail.

The property age is positively related to condominium and cultural place. These two outcomes show a 1.02 odds ratio meaning that an increase of 1 year on the property age increase the odds of choosing condominium or cultural place by 1.02 times compared to church to church, holding all else constant.

Existence of a steeple is positively related to retail and low income housing. Retail has a 3.94 odds ratio while low income housing has a 6.94 odds ratio. This result indicates that religious buildings with a steeple are 3.94 times more likely reused for retail, and 6.94 times more likely reused for low income housing compared to church to church, respectively, holding all else constant.

The proximity to park is negatively related to office and retail while it is positively related to school. Office has a 0.75 odds ratio, retail has a 1.44 odds ratio and school has 0.1 odds ratio. This result indicates that being one driving mile closer to the park decreases the odds of choosing office by 0.75 times and retail by 1.44, respectively while it increase the odds of choosing school by 0.1 times compared to church to church controlling for all other variables.

Central city location is positively related to condominium, office and retail space. Office has larger odds ratio with 6.44 meaning religious buildings located in the central city are 6.44 times more likely reused for office compared to church to church controlling for all other variables. Office is followed by retail (3.6) and condominium (2.99) meaning religious buildings located in the central city are 3.6 times more likely reused for retail or 2.99 times more likely reused for condominium compared to church to church controlling for all other variables. Office is the highest and best use in the

central city because its odds ratio is 80% higher than retail.

Historic district location is positively related to condominium, retail and cultural place. Retail has higher odds ratio with 4.01 followed by cultural place (3.92) and condominium (3.76). Religious buildings located in national historic districts are 4.01 times more likely reused for retail, 3.92 times more likely reused for cultural place or 3.76 times more likely reused for condominiums, respectively compared to church to church, holding all else constant. It seems that such reuse outcomes are almost equally preferred by initiators because differences of odds ratio are less than 7%.

The historic preservation tax credit is positively related to office, retail and low income housing. Low income housing has higher odds ratio with 2.61 followed by retail (2.39) and office (2.31). This result indicates that the historic preservation tax credit is 2.61 times more likely related to low income housing, 2.39 times more likely related to retail or 2.31 times more likely related to office compared to church to church, holding all else constant. I conclude that the low income housing tax credit is more related to low income housing because it has 11% higher odds ratio than retail while this tax credit is equally related to retail and office because differences of odds ratio are less than 5%.

The low income housing tax credit is positively related to low income housing. Low income housing as a reuse outcome has a 6.55 odds ratio indicating the low income housing tax credit is 6.55 times more likely used for low income rental housing compared to church to church controlling for all other variables. The new market tax credit is positively related to retail. Retail has a 2.89 odds ratio meaning the new market tax credit is 2.89 times more likely used for retail compared to church to church, holding all else constant.

*6.5 Discussion on Marginal Effect of Each Factor*

This section in Chapter 6 discusses marginal effect of each factor including, building characteristics, location characteristics, demographic changes, local commercial market conditions, macro economic conditions, seller's denomination, national historic designation and uses of tax credits.

Location characteristics and building characteristics are important factors and have larger marginal effect. When variables of location characteristics were included in Model 3, Pseudo R Squared were increased approximately 13% compared to Model 2. In addition, when variables of building characteristics were included in Model 4, Pseudo R Squared were increased approximately 10% compared to Model 3.

Model 6 is the best model in terms of Pseudo R Squared. This model excluded reuse cases which were done before 1990 to minimize the internal validity threat. There were not considerable differences between Model 4 and Model 7. Dummy variables indicating uses of three tax credits were including in Model 4 while tax credits were included as logged actual credit dollars in Model 7.

Table 6-2 Testing Effects of Determinants

| **Variables** | Condominiums | Offices | Retail Space | Low Income Housing | School | Cultural Place | Undeveloped |
|---|---|---|---|---|---|---|---|
| | z-value | z-value | z-value | z-value | z-value | z-value | z-value |
| ***Building Characteristics*** | | | | | | | |
| LNBLDFTPRINT | | -2.73*** (0.35) | -2.39** (10.81) | | -1.92* (6.42) | | 2.45** (7.60) |
| LNBLDSIZE | -1.68* (0.04) | -4.52*** (0.60) | -4.30*** (0.02) | | | | |
| LNLOTSIZE | -2.32** (0.25) | | | | 2.12** (5.20) | | -2.64*** (0.20) |
| FAR | | | 1.95* (85.41) | | 2.40** (96.00) | | |
| STORY | | | -1.97* (3.44) | | | | |
| AGE | 2.07** (1.02) | | | | | 2.09** (1.02) | |
| STEEPLE | | | 1.56* (3.94) | 1.79* (6.94) | | | |
| BLUFF_STONE | | | | | | | |
| RED_BRICK | | | | 4.36*** (11.23 | | | |
| ***Location Characteristics*** | | | | | | | |
| PARK | | 2.97*** (0.75) | 2.22** (1.44) | | -2.66*** (0.10) | | |
| LAKE | | | | | | | |
| HIGHWAY | 3.06*** (1.36) | | | | | | 1.69* (1.23) |
| MAIN_ST | | | | | | | |
| CENTRALCITY | 1.89* (2.99) | 2.56** (6.44) | 1.86* (3.60) | | | 1.88* (2.94) | |
| MA | 2.54*** (12.44) | 1.95** (9.98) | | 2.30** (32.30) | | | |
| CA | | | -2.10** (0.08) | | | -2.22** (0.09) | . |
| NY | 1.75* (5.83) | | | | | | |
| FL | | | | | | | -1.95* (0.11) |
| TX | | | | | | | |
| ***Demographic Sifts*** | | | | | | | |
| POPCHANGE | | | | | | | |
| INCOMECHANGE | | | | | | | |
| OWNERCHANGE | | | 2.23** (0.00) | | 2.48** (0.00) | 2.51** (0.00) | |
| EDUCHANGE | | | | | -3.20*** (0.00) | | |

| **Variables** | Condominiums | Offices | Retail Space | Low Income Housing | School | Cultural Place | Undeveloped |
|---|---|---|---|---|---|---|---|
| | z-value | z-value | z-value | z-value | z-value | z-value | z-value |
| ***Commercial Market Condition*** | | | | | | | |
| RETAIL | | | | | | | |
| OFFIC | | | 1.67* (0.00) | | | 1.68* (0.00) | |
| ***Macro Economic*** | | | | | | | |
| UNEMPLOYMENT | -2.85*** (0.00) | | | | -2.15** (0.00) | -2.33** (0.00) | |
| TBILL | | | -2.27** (0.00) | -2.92*** (0.00) | -2.48** (0.00) | -3.15*** (0.00) | -3.73*** (0.00) |
| ***Sellers' Denomination*** | | | | | | | |
| HIFAITH | | | | | | | |
| ***Historic Designation*** | | | | | | | |
| HISLNDMARK | | | | | | 1.99* (1.23) | |
| HISDISTRICT | 13.03*** (3.76) | | 14.49*** (4.01) | | | 13.89*** (3.92) | |
| ***Tax Credits*** | | | | | | | |
| HPTC | | 1.99** (2.31) | 2.09** (2.39) | 2.30** (2.61) | | | |
| LIHTC | | | | 3.51*** (6.55) | | | |
| NMTC | | | 2.13** (2.89) | | | | |

Note:

1. z-values that are statistically significant were reported
2. *, ** and *** denote statistical significance at the 90%, 95% and 99% level of confidence, respectively
3. This table reports results of Model 7 except results of LNBLDSIZE and STEEPLE. Results of LNBLDSIZE and STEEPLE were from Model 5.

*6.6 Retail as a Reference Category.*

I ran another multinomial logit model using retail as a reference category. Appendix JJ shows results of the multinomial logit regression analysis using retail as a reference category (control group). 7 comparisons were generated by this multinomial logit model. Odds ratios are included in parentheses if variables are statistically significant. Pseudo R Squared of this model was 0.46.

In this model, FAR was negatively related to office and condominium compared to retail. This result may indicate that smaller size of religious buildings have been redeveloped as office and condominium. It is quite interesting that condominium is smaller than retail.

In this model, interestingly HIFAITH was positively related to school, low income housing and office compared to retail. This result may indicate that hierarchical sellers have not preferred retail users as their buyers. School has higher odds ratio of 6.43 meaning religious buildings occupied by hierarchical sellers are 6.43 times more likely reused for schools compared to retail. School is followed by office and low income housing.

LIHTC matters for low income housing with odds ratio of 12.32 indicating religious buildings converted into low income housing were 12.32 times more likely redeveloped with the low income housing tax credit compared to retail. On the other hand, HPTC cannot determine reuse outcomes because it seems that office and low income housing were compared to retail. NMTC can determine retail from office. It has a 0.44 odds ratio meaning religious buildings reused for retail were 0.44 times more likely redeveloped with the new market tax credit.

Based on results of both multinomial logit regression analyses using “church to church” as a reference category and retail as a reference category, indicators of size of the property such as floor area ratio, building size and lot size are important to select highest and best uses. As presented in Table 6-2 and Appendix JJ, office and retail can be selected as reuse outcomes if religious buildings have smaller lot or building. Interestingly, condominiums are preferred when buildings are small. This result indicates that smaller buildings have provided opportunities of development for-sale multifamily housing with small number of units. Existence of steeple is preferred for church to church, cultural and condominium. Overall the proximity to parks is preferred by school or residential users while is not preferred by commercial users. The location of Main Street is always preferred by retail redevelopers while not preferred by all other initiators. It seems that sacred landmark seems not important factor while the location of historic district is always important for various initiators.

According to results of multinomial logit regression analyses using “church to church” as a reference category and “retail” as a reference category, tax credits are important determinants. The relationships between tax credits and each outcome presented in Table 6-2 were confirmed by Appendix JJ. However effects of the historic preservation tax credit on office or on retail were not confirmed because I compared retail to office meaning its effects were offset.

Chapter VII will present conclusions of this dissertation. It will discuss sumarry of major empirical findings, policy recommendations, limitations of the dissertation and future research.

# CHAPTER VII

# CONCLUSIONS AND POLICY RECOMMENDATIONS

## *7.1 Objectives of this Dissertation*

The adaptive reuse of historic buildings generates many tangible and intangible benefits. These benefits are not limited to the initiator (usually the developer) but expanded to the community and the local government. Developers can save their project costs considerably when they initiate reuse projects because they can develop the building without demolition costs, and they can minimize building costs since existing buildings tend to be reused. For the public interest, local government can protect their environment because adaptive reuse projects generate less neighborhood waste than new construction projects. Adaptive reuse can create valuable community resources from unproductive property, substantially reduce land acquisition and construction costs, revitalize existing neighborhoods and help control sprawl (Bullen, 2007). In addition,

adaptive reuse of existing, but abandoned, buildings can be used as a tool to revitalize urban area due to job creation, tax revenues and historic preservation.

Economic benefits and redevelopment opportunities are highlighted as the critical role of neighborhood religious buildings in the community in contemporary times (Mian, 2008). Although the change to reuse and adaptation of historic buildings is a popular wide trend, there is little empirical research dealing with initiator's decision to redevelop historic buildings and their choice of reuse outcomes. Factors including internal and external factors, which affected choice of reuse outcomes, have not been investigated by academic studies. Moreover the role of historic district, Commercial Market conditions and tax credits including the historic preservation tax credit, the low income housing tax credit and the new market tax credit.

The purpose of this dissertation was to determine factors that are associated with the choice of outcomes of religious building reuse projects in the United States. The historic preservation tax credit, the low income housing tax credit and the new market tax credit were main focuses of the dissertation. In addition to such tax credits, I have addressed relationship between national historic designations, commercial market conditions and choices of reuse outcomes.

Both case studies and statistical analyses were conducted. Five religious buildings that have been reused for different purposes are dealt in Chapter 2: the Meridian Street Methodist Episcopal Church in Indianapolis, IN; the Notre Dame Academy in Cleveland, OH; the Ashbury Delaware Methodist Church in Buffalo, NY; the First Church of Christ Scientist in Cleveland, OH; and the Orthodox Jewish Congregation – Cheva Bikur Cholim in Seattle, WA were included for the multiple-case

study. Not only historic values and architectural significance, but also the use of tax credits was investigated.

Using individual religious buildings reused for different purposes, on the market or sold to other religious entities, as the unit of analysis, the multinomial logit regression models were run to test statistical hypotheses addressed in Chapter 6. A dependent variable was a discrete variable indicating reuse outcomes including condominium, office, retail, low income housing, school, cultural place, “church to church and undeveloped. This dissertation also controlled literature-driven internal and external factors that might affect the outcomes of religious building reuse projects. “Church to Church” was set as a reference category meaning this dissertation compared this outcome to each outcome. Therefore, one multinomial logit regression analysis generated seven results.

Three dummy variables or continuous variables indicating the uses or actual amount of the historic preservation tax credit, the low income housing tax credit and the new market tax credit on reuse outcomes, to measure effects of tax credits on reuse outcomes. Two dummy variables were used to represent the national historic designations. HISLNDMARK was used to measure the effects of religious buildings located in the national historic district, and HISDISTRICT was used to measure the effects of religious buildings designated as national sacred landmarks. Office occupancy rates and retail occupancy rates obtained by zip code from CoStar Group were used to measure the effects of Commercial Market conditions on reuse outcomes.

*7.2. Motives of this Dissertation*

This dissertation builds on a call option theory that gives deep understanding about the investment timing of the option writers. In addition, literature-driven factors were used to evaluate determinants of outcomes of religious building reuse projects.

The main idea and concept of this dissertation were driven by the Book which has been undertaken by two professors in the Levin College of Urban Affairs at Cleveland State University, Dr. Robert A. Simons and Dr. Larry Ledebur, and one city planner, Gary DeWine who has recently retired after 30 years in community development for the City of Euclid, Ohio. The title of the book was “No Building Left Behind: New Uses for America’s Religious Buildings and Schools.” This book project was under contract with Urban Land Institute (Washington D.C.). I was also involved in writing chapters as an author or co-author, and in collecting church data that supports each chapter. I have collected two different kinds of datasets: religious buildings reused for different purposes in the United States, and trends of the number of denominations and adherents.

To obtain the list of religious buildings reused for different purposes in the United States, available sources such as non-profit organizations’ websites, commercial real estate information companies, and electronic articles were reviewed. After I put basic information of religious buildings such as names and addresses in the Excel spread sheet, I began to collect valuable information such as building characteristics, the proximity to urban amenities, location demographics, denomination information and macro economic conditions. The initial dataset included both religious buildings and schools reused for different purposes. I and Dr. Robert A. Simons, who was a leading

author of the book, ran the multinomial logit regression model using religious buildings and schools as the unit of analysis. The model only included successfully reused cases. The results of this analysis were addressed in chapter 4 of the book. This chapter was developed and published in the academic journal, *International Real Estate Review (IRER)*.

However, Dr. Robert A. Simons and I felt there were several weak-points in the IRER paper driven by chapter 4. First, the number of cases including churches and schools was not enough to run the model with more than 25 variables. 126 religious buildings and 83 schools were included for the paper and chapter 4 of the book. But it was not enough. Therefore, we have felt we needed to obtain more samples. Second, we considered combining religious buildings with schools, and running the sample model generated serious internal validity threats; especially selection bias threats. Third, there were several missing pieces in terms of factors dealt with in the IRER paper, such as the financial standpoints, and historic value and architectural significance of the property. These are one of the core factors that might affect project initiators decision. Many reuse projects of religious buildings are public deals expecting positive externalities on neighborhoods. However public subsidies provided for the project initiators were not included in the IRER paper. Four, the IRER paper only dealt with religious buildings which are successfully reused for different purposes in the United States. The paper did not consider “church to church” and “undeveloped churches for a long time” as reuse outcomes.

On the other hand, since the IRER paper has been accepted, the list of religious buildings reused for different purposes in the United States is up to 207 cases. In

addition, the model in this dissertation excluded school buildings to minimize internal validity threats, and the model tested effects of tax credits including the historic preservation tax credit, the low income housing tax credit and the new market tax credit on reuse outcomes, and also tested the effects of the national historic designation which are proxies of historic values and architectural significance of the property on reuse outcomes.

*7.3 Summary of Empirical Findings*

This dissertation has found significant relationship between national historic district and choices of outcomes of religious building reuse projects, found that the historic preservation tax credit has been positively associated with office, retail and low income housing plans also found that the new market tax credit has been positively associated with retails spaces while a relationship between the new market tax credit and office was not found.

In order to test the hypotheses of this dissertation, the multinomial logit regressions were run. Relationships between the national historic designations, commercial market conditions, and the tax credits including the historic preservation tax credit, the low income housing tax credit and the new market tax credit and choices of outcomes of religious building reuse projects were mainly hypothesized in this dissertation. This part of Chapter 7 addresses a summary of hypotheses testing results focusing on income generating outcomes such as condominium, office, retail space and low income housing. Table 8-2 includes summary of hypotheses testing.

The size of building footprint is negatively related to office, retail and school.

Retail shows larger odds ratio with a negative 7.81 followed by office (-3.50) and school (-2.42). This result indicates that a decrease of 1% on the size of building footprint increases the odds of choosing retail by 7.81 times, choosing office by 3.5 times and choosing school by 2.42 times compared to “church to church,” holding all else constant. Thus I should conclude that retail as a reuse outcome is the highest and best use for redundant religious buildings with smaller building footprint because the probability choosing retail is 2 times higher than choosing office.

The building size is negatively related to condominium, office and retail. Office shows larger with a negative 0.60 followed by condominium (0.04) and retail (0.02). This result indicates that a decrease of 1% on the building size increases the odds of choosing office by 0.6 times, choosing condominium by 0.04 times and choosing retail by 0.02 times compared to “church to church,” holding all else constant. Thus I should conclude that office as a reuse outcome is the highest and best use for redundant religious buildings with smaller building size.

The lot size is negatively related to condominium while positively related to school. Condominium shows odds ratio with negative 0.25 indicating that a decrease of 1% on the lot size increases the odds of choosing condominium by 0.25 times compared to church to church reuses. School shows odds ratio with positive 5.20 meaning that an increase of 1% on the lot size increases the odds for choosing school by 5.2 times compared to church to church reuses, holding all else constant.

Floor area ratio is positively related to retail and school indicating such reuse outcomes need more parking spaces or play grounds. Retail shows a positive 85.41 odds ratio meaning that an increase of 0.1% on floor area ratio increases the odds of choosing

retail by 8.54 times compared to church to church reuse, holding all else constant. School shows 96 odds ratio meaning that an increase of 0.1% on floor area ratio increases the odds of choosing school by 9.6 times compared to church to church controlling or all other variables. School has 12% higher probability than retail.

The property age is positively related to condominium and cultural place. These two outcomes show 1.02 odds ratio meaning that an increase of 1 year on the property age increase the odds of choosing condominium or cultural place by 1.02 times compared to church to church, holding all else constant.

Existence of a steeple is positively related to retail and low income housing. Retail has 3.94 odds ratio while low income housing has 6.94 odds ratio. This result indicates that religious buildings with a steeple are 3.94 times more likely reused for retail, and 6.94 times more likely reused for low income housing compared to church to church, respectively, holding all else constant.

The proximity to park is negatively related to office and retail while it is positively related to school. Office has 0.75 odds ratio, retail has 1.44 odds ratio and school has 0.1 odds ratio. This result indicates that an 1 driving mile closer to the park decreases the odds of choosing office by 0.75 times and retail by 1.44, respectively while it increase the odds of choosing school by 0.1 times compared to church to church, holding all else constant.

Central city location is positively related to condominium, office and retail space. Office has larger odds ratio with 6.44 meaning religious buildings located in the central city are 6.44 times more likely reused for office compared to church to church, holding all else constant. Office is followed by retail (3.6) and condominium (2.99) meaning

religious buildings located in the central city are 3.6 times more likely reused for retail or 2.99 times more likely reused for condominium compared to church to church, holding all else constant. Office is the highest and best use in the central city because its odds ratio is 80% higher than retail.

Historic district location is positively related to condominium, retail and cultural place. Retail has higher odds ratio with 4.01 followed by cultural place (3.92) and condominium (3.76). Religious buildings located in national historic districts are 4.01 times more likely reused for retail, 3.92 times more likely reused for cultural place or 3.76 times more likely reused for condominiums, respectively compared to church to church, holding all else constant. It seems that such reuse outcomes are almost equally preferred by initiators because differences of odds ratio are less than 7%.

The historic preservation tax credit is positively related to office, retail and low income housing. Low income housing has higher odds ratio with 2.61 followed by retail (2.39) and office (2.31). This result indicates that the historic preservation tax credit is 2.61 times more likely related to low income housing, 2.39 times more likely related to retail or 2.31 times more likely related to office compared to church to church, holding all else constant. I conclude that the low income housing tax credit is more related to low income housing because it has 11% higher odds ratio than retail while this tax credit is equally related to retail and office because differences of odds ratio are less than 5%. The low income housing tax credit is positively related to low income housing. Low income housing as a reuse outcome has 6.55 odds ratio indicating the low income housing tax credit is 6.55 times more likely used for low income rental housing compared to church to church controlling for all other variables. The new market tax

credit is positively related to retail. Retail has 2.89 odds ratio meaning the new market tax credit is 2.89 times more likely used for retail compared to church to church controlling for all other variables.

Table 7-1 Summary of Hypotheses Testing

| Variables | Condominiums | Offices | Retail | Low Income Housing | School | Cultural | Undeveloped |
|---|---|---|---|---|---|---|---|
| ***Commercial Market*** | | | | | | | |
| RETAIL | | | | | | | |
| OFFICE | | | | | | | |
| ***Historic Designation*** | | | | | | | |
| HISLNDMARK | | | | | | + | |
| HISDISTRICT | + | | + | | | + | |
| ***Tax Credits*** | | | | | | | |
| HPTC | | + | + | + | | | |
| LIHTC | | | | + | | | |
| NMTC | | | + | | | | |

Note: This table only presents result of hypotheses testing if positive relationships between reuse outcomes and factors were found (this table summarizes table 6-2 and Appendix JJ).

*7.4 Contribution to the Literature*

Religious buildings in the United States are attractive to investors who seek adaptive reuse projects since such buildings tend to retain features that are linked with the history of a neighborhood. These features are translatable into financial benefits for the developers and general public (Simons and Choi, Forthcoming). Therefore, initiators of these projects have increasingly sought to convert historic, underused religious buildings into residential housing, retail centers, and office space, particularly when they believe that the style of the building has the potential to produce increased profits and other benefits.

Although the change to reuse and adaptation of historic religious buildings is a word-wide trend, there is little empirical research dealing with adaptive reuse projects of historic religious buildings. Simons and Choi (Forthcoming) investigated factors that determined outcomes of reuse of churches and schools. However they did not consider

policy factors that affect reuse plans. These policy side factors include public subsidies such as tax credits, and also include historic designation. Changes to planning and development policies of local government allow more reuse opportunities for both public and private initiators by providing public subsidies and designating buildings as historic places. In addition their paper did not analyze the effects on commercial market factors such as retail and office occupancy rates.

In this dissertation I investigated the role of tax credits including the federal historic preservation tax credit, the low income housing tax credit and the new market tax credit in initiators' decision to reuse religious buildings and in initiators' choice of reuse project outcomes. These tax credits are the most popularly used tax credits in historic preservation projects (Saurwein and Simons, Forthcoming). In addition, I also test whether or not religious buildings are located in national historic districts or religious buildings were designated as sacred landmarks have affected initiators decision to reuse religious buildings and in initiators choice of reuse project outcomes. This is the first academic dissertation, and it is also the first academic research, that tests these factors as reuse determinants.

Empirical findings of this dissertation suggest that federal tax credits including the historic preservation tax credit, the low income housing tax credit and the new market tax credit have been positively associated with reuses of religious buildings for different purposes. In addition, empirical findings of this dissertation suggest that historic values and architectural significance were associated with choices of reuse outcomes.

*7.4.1 Limitations of this Dissertation*

There are several limitations of this dissertation. First, there is an internal validity threat on the sampling methods. A threat to internal validity comes from selection bias and ambiguous temporal precedence. Selection bias is one of the internal validity threats that can be occurred when there are systematic differences between groups over conditions in cases that could also cause the observed effects (Shadish, Cook and Campbell, 2002). Three sub-groups of the sample including religious buildings adaptively reused for different purposes, on the market, and sold to other religious buildings have different populations meaning the sample in each group was collected from difference sources. Therefore religious buildings in each group might already differ. Ambiguous temporal precedence as an internal validity threats refers that causation is bidirectional (Shadish, Cook and Campbell, 2002). In this dissertation, several variables and reuse outcomes are correlated. For example, growing population can be induced by redevelopments of religious buildings especially in the core urban areas vice versa. In other words, findings from this dissertation are not indicating a causal relationship between statistically significant variables and choices of outcomes of religious building reuse projects. A causal relationship exists if the cause preceded the effect, the cause was related to the effect, and we can find no plausible alternative explanation for the effect other than the cause (Shadish, Cook and Campbell, 2002). Findings of this dissertation do not meet the first compulsory assumption. That is, several religious building reuse cases were done before 2000, meaning demographic changes from 1990 to 2000 do not precede choice or reuse outcomes.

Second, there is an external validity threat in this dissertation. External validity

concerns inferences about the extent to which a causal relationship holds over variations in persons, settings, treatments, and outcomes (Shadish, Cook and Campbell, 2002). In this dissertation, for example, external validity refers to the extent to which determinants tested in this dissertation can also determine reuse outcomes of religious buildings that are not included in the sample of this dissertation. I used a non-probability sampling method to get a list of religious buildings reused for different purposes in the United States. In other words, the list of this group represents a non-random subset of the actual cases of this type in the US meaning results can be biased and can not represent population. To minimize an external validity threat of the sample, however, religious buildings obtained from these sources were not excluded without reasonable cause: all reuse cases of religious buildings that have been listed in non-profit organizations' websites[17] and CoStar's database were included, meaning that there were no differences in probabilities to the selected religious buildings. However, still sample size of this dissertation is not enough to generalize its findings to other religious buildings.

Moreover, the results of this dissertation may not be applied for other types of properties. The differences result from the final reuse of the project, due to the differences in structure, size, and location of churches and schools. For instance, school buildings are big and functional (but not generally fancy), sit on a spacious lot (especially those outside the urban core) with a structure appropriate for residential units, therefore, and they tend to be redeveloped as residential apartments (Simons and Choi, 2010). Redevelopment projects were undertaken by various types of developers, such as

[17] Usually theses organizations refer to non-profit entities which use the tool of historic preservation to revitalize communities and strengthen the regional economy.

nonprofit, for-profit, and partnerships (Simons and Seo, Forthcoming).

Third, regarding external validity, this dissertation has small sample size which might generate biased statistical findings. All else being equal, a smaller sample size leads to decreased precision in estimates of various properties of the population (Meyers, Gamst and Guarino, 2006). Although there is no clear criterion, 341 cases are not enough to test more than 20 independent variables in one model. Moreover frequencies of several dummy variables are too small to represent the population. For example, the low income housing tax credits were used for only 2 religious buildings converted into offices out of 26. Such smaller frequencies of several dummy variables led to difficult interpretation.

Fourth, the multinomial logit models assume the error terms of the utility functions are independent, meaning that the outputs (alternatives) are not correlated. However, the models in this dissertation violated the Independence of Irrelevant Alternatives (IIA). IIA of multinomial logit models is a limitation for some practical applications (Ben-Akiva and Lerman, 1985). Normally, the probability of choosing one of eight outcomes is 0.125; however, public agencies might not choose for-profit reuse outcomes. Thus, even if there are eight possible outcomes for any initiator, public agencies may be limited to only three outcome choices: low income housing, schools, and cultural places. More specifically, some public agencies working to provide low income rental housing have only one outcome choice.

Fifth, there is the limitation of the multinomial logit regression analyses in that the multinomial logit models require selecting one outcome as a reference category. “Church to Church” was set as the reference category, meaning that this outcome was

compared to all other variables' outcomes. The limitation is that results driven by the multinomial logit models did not reveal comparison among outcomes, only against the reference category. Although there were statistically significant relationships found between low income housing and the historic preservation tax credit, this result does not reveal that such tax credits have been effectively working for conversions of religious buildings into low income housing because the effects of the historic preservation tax credit on retail outcomes were compared to the effects on "church to church", which were none. The only comparison that could be made was to compare the magnitude of coefficients of estimator parameters for each outcome; this does not tell the statistically significant differences among estimator parameters.

*74.2 Policy Recommendations*

Religious buildings in distressed communities, especially those in central cities have been considerably redundant in the United States. Therefore the efficient and purposeful creative reuse projects of redundant religious buildings have appeared as one of the major tasks of community planners. Several policy recommendations can be pointed out based on the empirical findings of this dissertation.

First, community planners should realize redundant religious buildings are extremely good candidates for low income housing, if the building is eligible they can fill the financing gap through the historic preservation tax and the low income housing tax credit. For the public agencies, gap financing is really important to initiate reuse projects. Using one of these two tax credits, or using both tax credits, they can fill the financing gap. According to the empirical findings of this dissertation, the low income

housing tax credit have been involved in adaptive reuse projects of religious buildings when religious buildings were reused for low income rental housing. However reuses of religious buildings for low income rental housing are not popular. Only 10% of the total reuse projects of religious buildings were low income housing projects. However reuse projects of religious buildings for low income housing may need larger lot and building sizes. If there are fewer barriers in terms of the capacity of the religious building, conversions of religious buildings into low income housing may be attractive to public agencies including CDCs, because it preserves the historic value and architectural significance of historic structures, while serving low income communities. In addition, hierarchical denominations would gladly sell their properties to public agencies so that they can reuse redundant Catholic churches for low income housing. This may be considered as the best option for them if they cannot manage their properties because of the shrink of adherents. Empirical findings of the previous IRER and this dissertation support that hierarchical denominations preferred low income rental housing. Moreover, the historic preservation tax credits are also available if properties are eligible.

Second, historic value and the architectural significance of religious buildings are one of core factors that affect initiators' decision to invest. As Simons and Choi (Forthcoming) pointed out, initiators (developers) may consider religious buildings with valuable architectural style making such properties more attractive, thus developers can expect higher rates of return or shorter absorption periods compared to normal new construction projects. This is supported by the empirical findings of this dissertation. Although religious buildings are redundant or placed on the market, public planners should put their effort to preserve historic values and the architectural significance of

properties.

Third, community planners and experts in local governments should collaborate with religious leaders in churches. Hierarchical denominations may need support from community planners and experts in local governments. Hierarchical religious entities arrive at their disposal decision “en-masse” (no pun intended- in batches). They should make this a rational and systematic process because of their influence in the community. Their properties tend to be placed on the market “en-mass”, meaning many times they will be facing difficulties finding new users.

Fourth, communities’ awareness and resistance for the reuse of religious buildings should be overcome. In general, neighbors do not like changes in the function of religious buildings (Simons and Seo, Forthcoming). They may consider that reuse projects of religious buildings are sacrilegious, or they may consider that they will be facing increased crime rates, but decreased school quality, if religious buildings in their communities are reused for low income housing. Therefore, their awareness should be overcome. Community planners should remember that many reuse opportunities are missed because the community has its head in the sand (Simons and Seo, Forthcoming). Religious buildings in the United States are located everywhere, even in highly distressed areas. However, these buildings located in distressed communities have become redundant because of suburbanization and immigration as discussed in Chapter 3. Therefore, adaptive reuse may be the last, but the best, option for those communities because demolition of a religious building and new construction need much more capital. Neighbors have to be educated about adaptive reuse options and they need to realize the positive externalities of reuse projects. This is a core job for the community planners.

Fifth, local government should be considerably involved in creative reuse projects. Reuse projects are labor intensive projects, thus in many cases support of the local government may be needed. Local governments also should be involved in providing public subsidies. Many reuse projects are directly connected to Brownfield remediation (Choi, 2010). Existing Brownfields increase projects costs because the developer must spend more capital for removal. This is a major barrier to the redevelopment of religious buildings if such buildings have Brownfields.

### *7.4.3 Future Research*

Future research includes investigating the positive externalities of adaptive reuse projects of religious buildings. There may be positive impacts on nearby property values or rents of surrounding retail shops. Adaptive reuse is the most active historic preservation tool (Tyler, 2000) needing public subsidies to complete the project. Therefore if there are positive spillover effects of adaptive reuse projects of religious buildings on neighborhoods' housing sales prices or retail rents, public subsidies can be justified (Choi, 2010; Simons and Seo, Forthcoming). In addition, the spillover effects if religious buildings they were designated as national or local historic places can be generated on nearby property values. The results of this research will justify preserving effort for religious buildings

Future research also includes determinants of outcomes of different property type reuse projects. For example, schools have totally different building frameworks and site features. Therefore different determinants can affect the initiator's decision- making process as determinants for religious building reuse projects. In addition to this research,

the effects of Brownfield remediation on neighborhood's property values and rents will be another research topic. The purpose of this study is to justify remediation efforts, such as Brownfield Redevelopment Funds (BRF) in Cleveland, Ohio, on community Brownfield through adaptive reuse projects.

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# APPENDIX

## APPENDIX A

## CASE STUDY INTERVIEW DISCUSSION GUIDE

The purpose of this interview plan is to outline the questions that will be asked during the "in-depth-interview" with the developer, or initiator, of each chosen adaptive reuse project taking place within religious buildings in the United States. The answers to each question will be used for academic purposes only.

***Introduction***

Please briefly explain the concept of the project, history of the site, developer, prior owner, prior use and project size (building and lot size).

***Detailed Site History***

Please provide detailed site information including history, date built, original use, previous owners and building characteristics. Additionally, include distinctive features and historic preservation status such as the national, state or local historic register.

***Site Location and Market***

Please briefly explain characteristics specific to the location: what were the advantages and what were the disadvantages of the location. Were there any amenities particular to the project location?

Please briefly explain the market condition at the time of investment, also what was the expected absorption period.

***Project Financing***

Please briefly verify sources and uses of funds (equity) and public investment, including tax credits, provide any types of public subsidies the project received.

***Investment Decision***

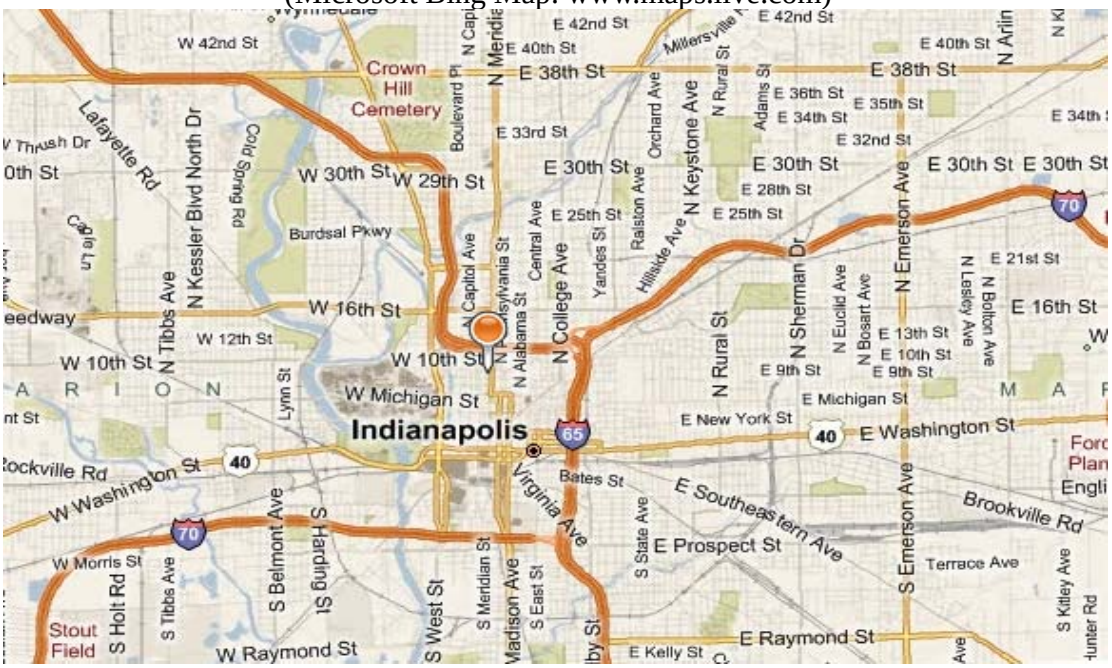
What were the most important factors driving your decision to invest capital on this project? Factors may include location, market, historic status and feasibility of the project.

Thank you for your time. Please contact Eugene Choi at 216-224-6791 or e.choi99@csuohio.edu , if you have any questions regarding this interview

**APPENDIX B:**

**LOCATION OF THE MERIDIAN STREET METHODIST EPISCOPAL CHURCH**

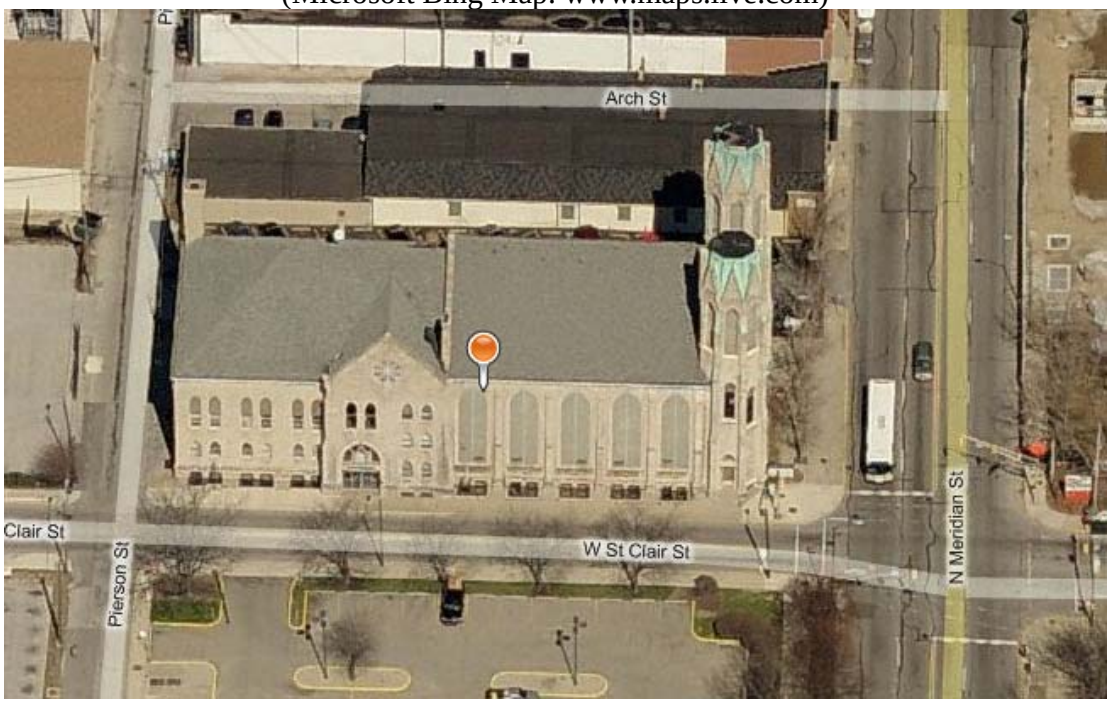
(Microsoft Bing Map: www.maps.live.com)



## APPENDIX C

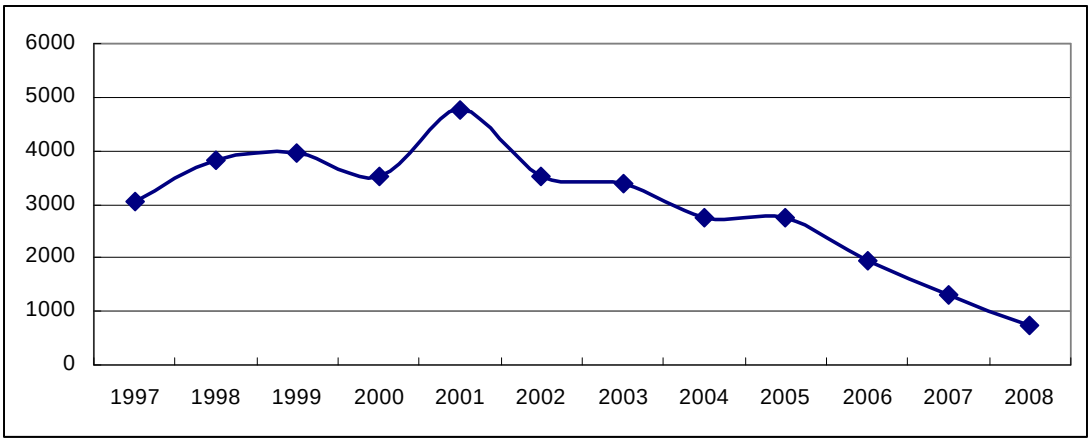
**BIRD'S EYE VIEW OF *THE MERIDIAN STREET METHODIST EPISCOPAL CHURCH***

(Microsoft Bing Map: www.maps.live.com)



## APPENDIX D

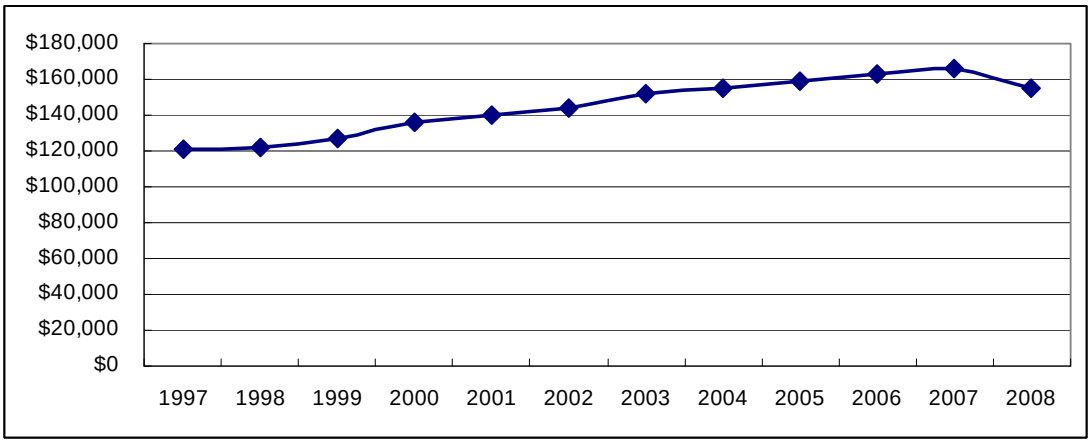
**TREND OF NEW HOUSE BUILDING PERMITS IN INDIANAPOLIS, INDIANA**
(City-Data.com)



## APPENDIX E

### TREND OF AVERAGE COST TO BUILD A HOUSE

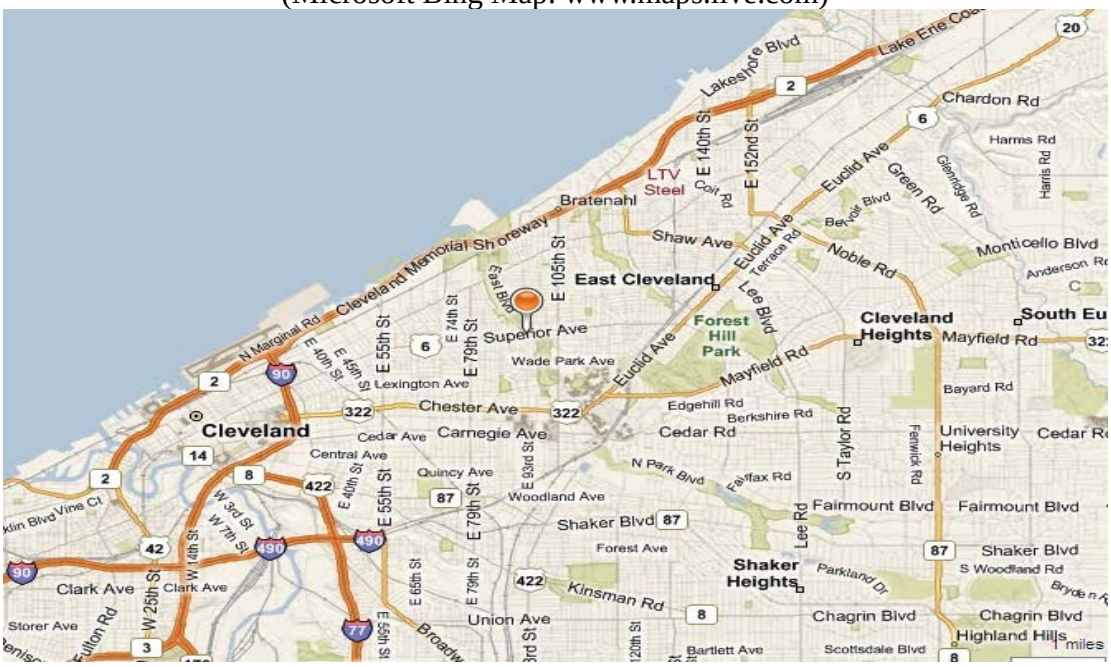
(City-Data.com)



## APPENDIX F

### LOCATION OF THE NOTRE DAME ACADEMY, CLEVELAND OHIO

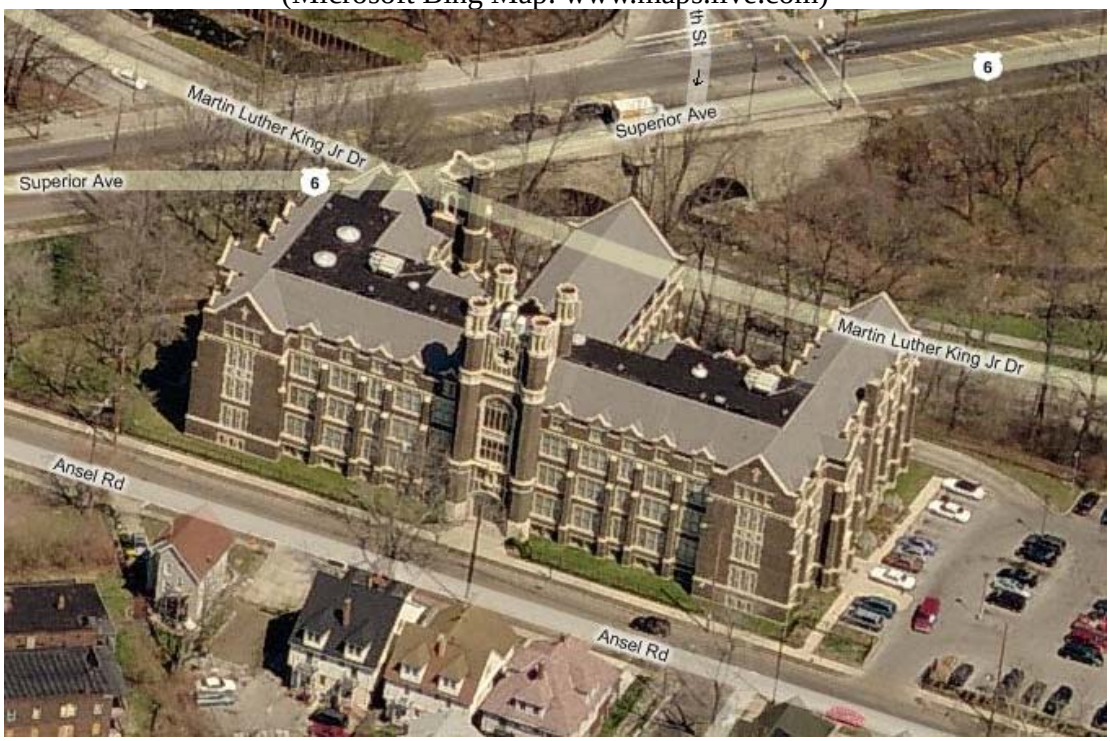
(Microsoft Bing Map: www.maps.live.com)



## APPENDIX G

### BIRD'S EYE VIEW OF THE NOTRE DAME ACADEMY

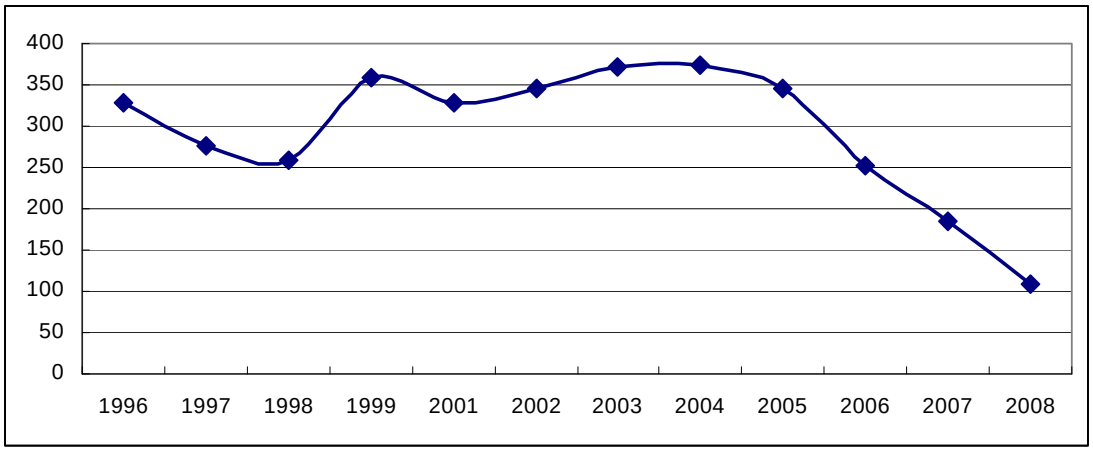
(Microsoft Bing Map: www.maps.live.com)



## APPENDIX H

### TREND OF BUILDING PERMITS IN CLEVELAND, OHIO

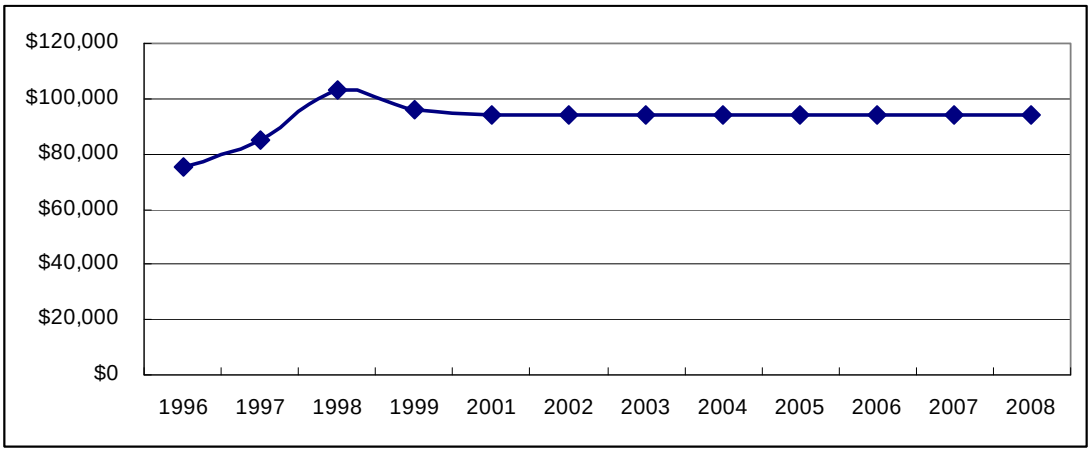
(City-Data.com)



## APPENDIX I

### TREND OF AVERAGE COST TO BUILD A HOUSE

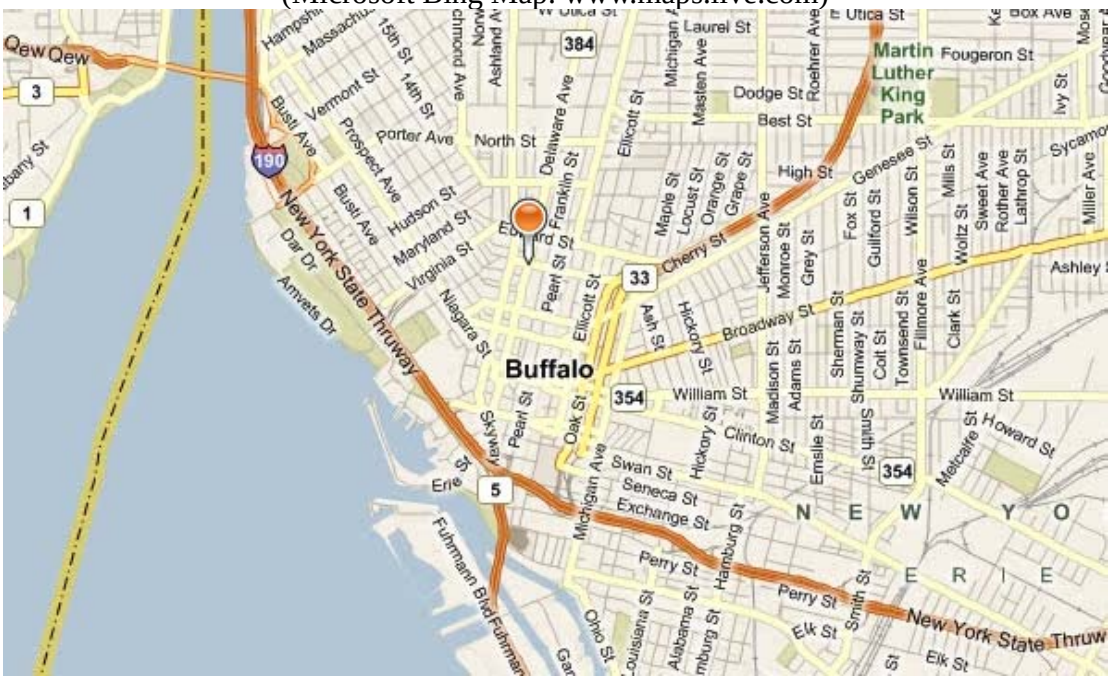
(City-Data.com)



**APPENDIX J**

**LOCATION OF THE ASHBURY DELAWARE METHODIST CHURCH, BUFFALO NY**

(Microsoft Bing Map: www.maps.live.com)

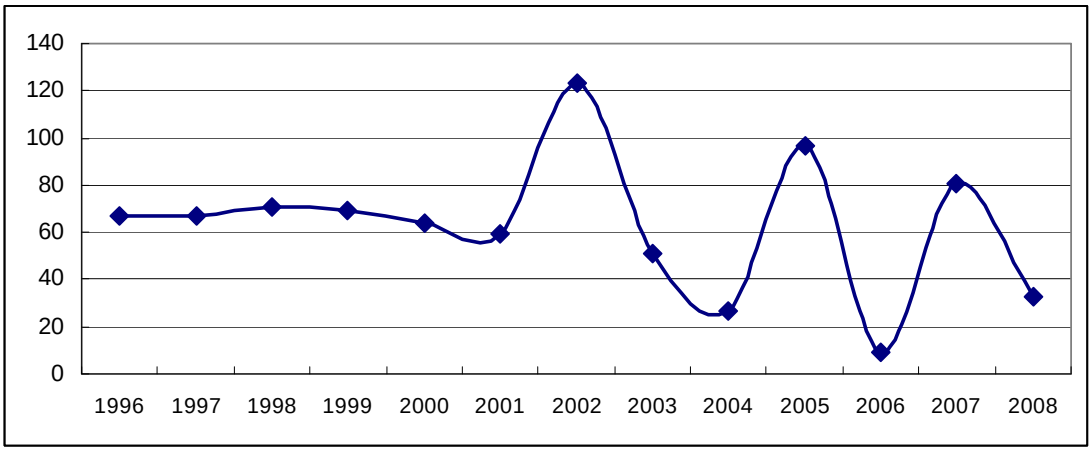


## APPENDIX K

**BIRD'S EYE VIEW OF THE ASHBURY DELAWARE METHODIST CHURCH**
(Microsoft Bing Map: www.maps.live.com)

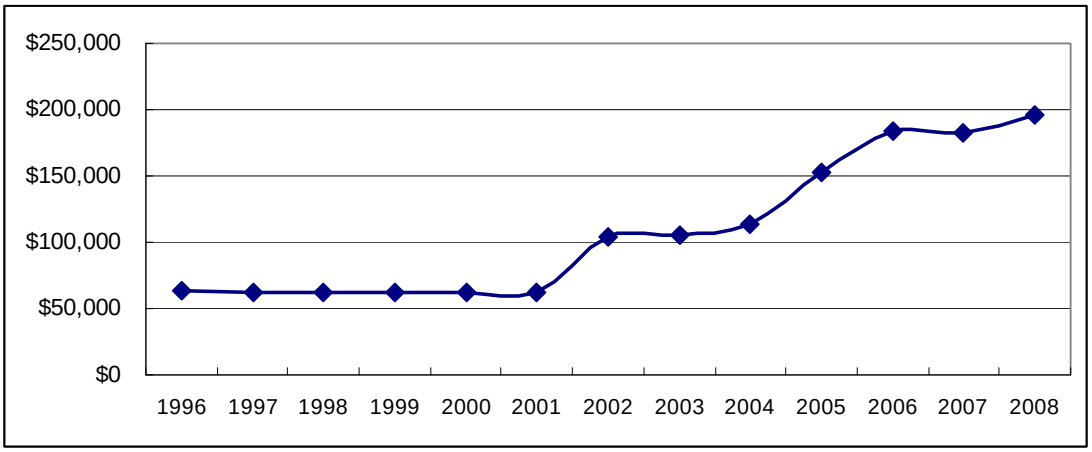
## APPENDIX L

**TREND OF NEW HOUSE BUILDING PERMITS IN BUFFALO, NEW YORK**
(City-Data.com)



## APPENDIX M

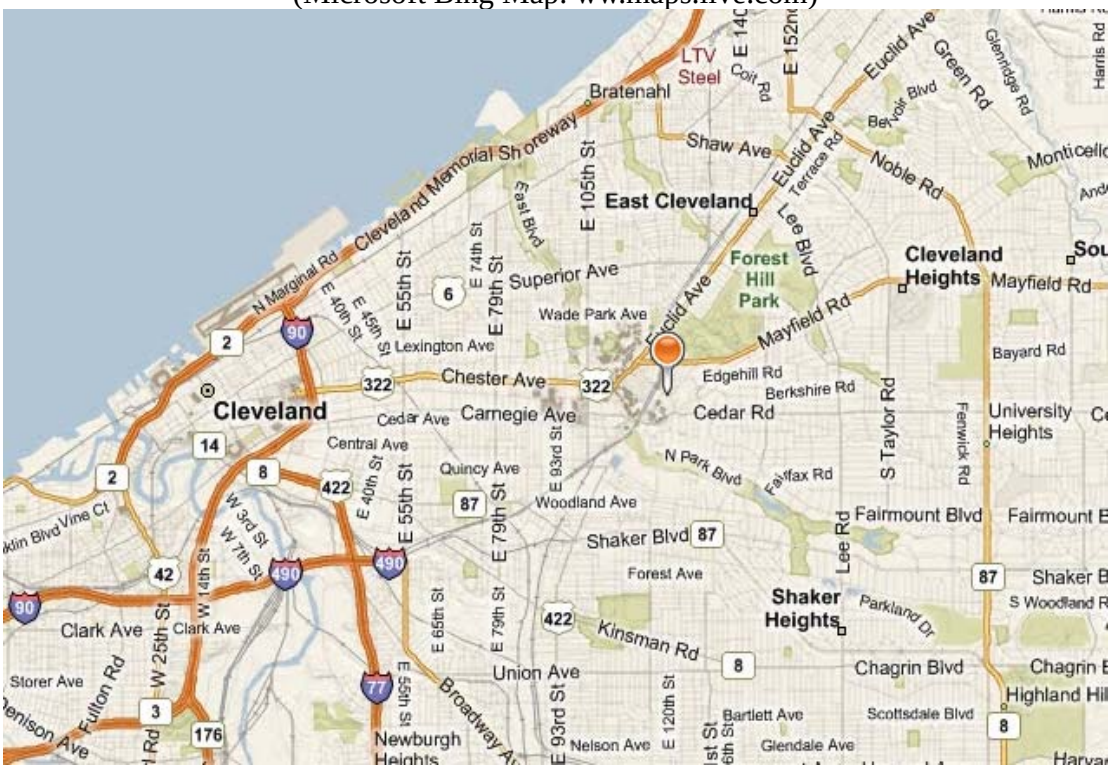
**TREND OF AVERAGE COST TO BUILD A HOUSE IN BUFFALO, NEW YORK**
(City-Data.com)



## APPENDIX N

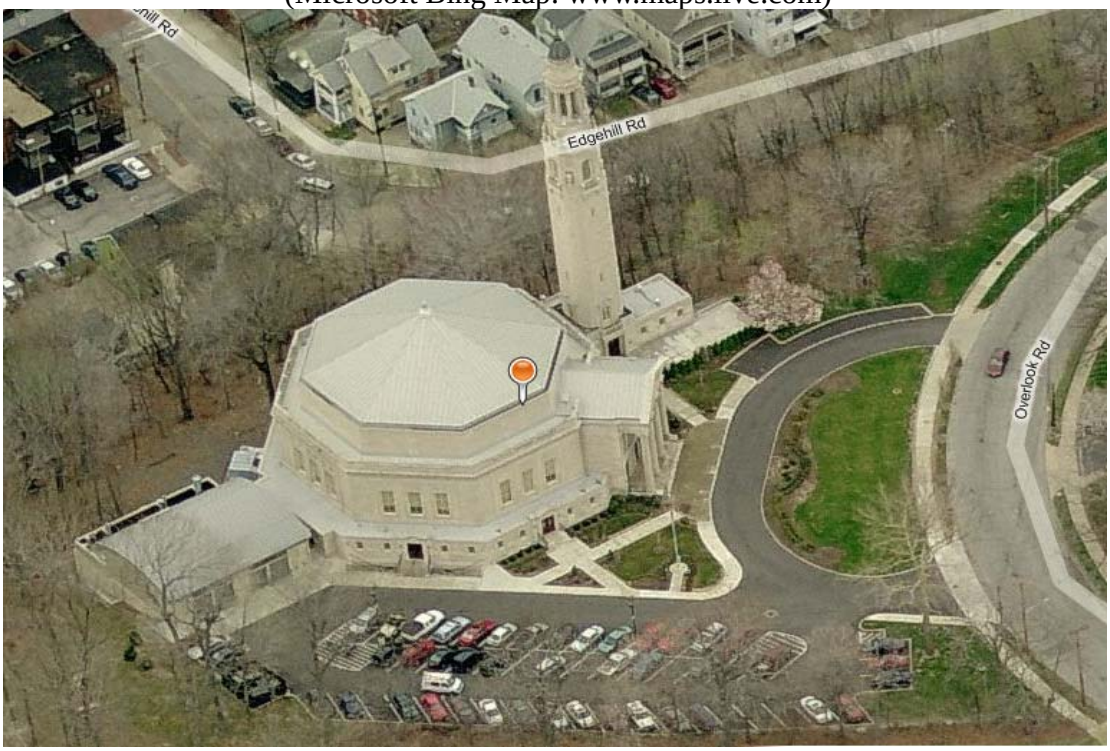
## LOCATION OF THE FIRST CHURCH OF CHRIST SCIENTIST, CLEVELAND OH

(Microsoft Bing Map: ww.maps.live.com)



## APPENDIX O

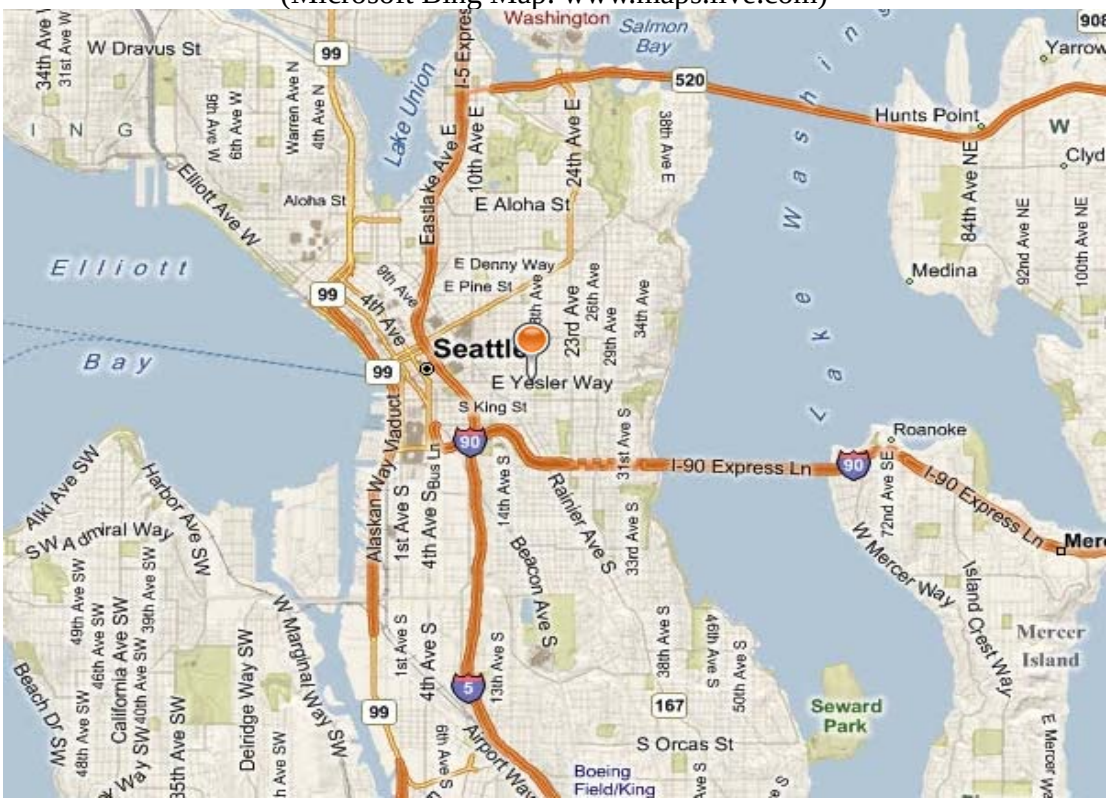
**BIRD'S EYE VIEW OF THE FIRST CHURCH OF CHRIST SCIENTIST**
(Microsoft Bing Map: www.maps.live.com)



## APPENDIX P

### LOCATION OF THE ORTHODOX JEWISH CONGREGATION CHEVA BIKUR CHOLIM

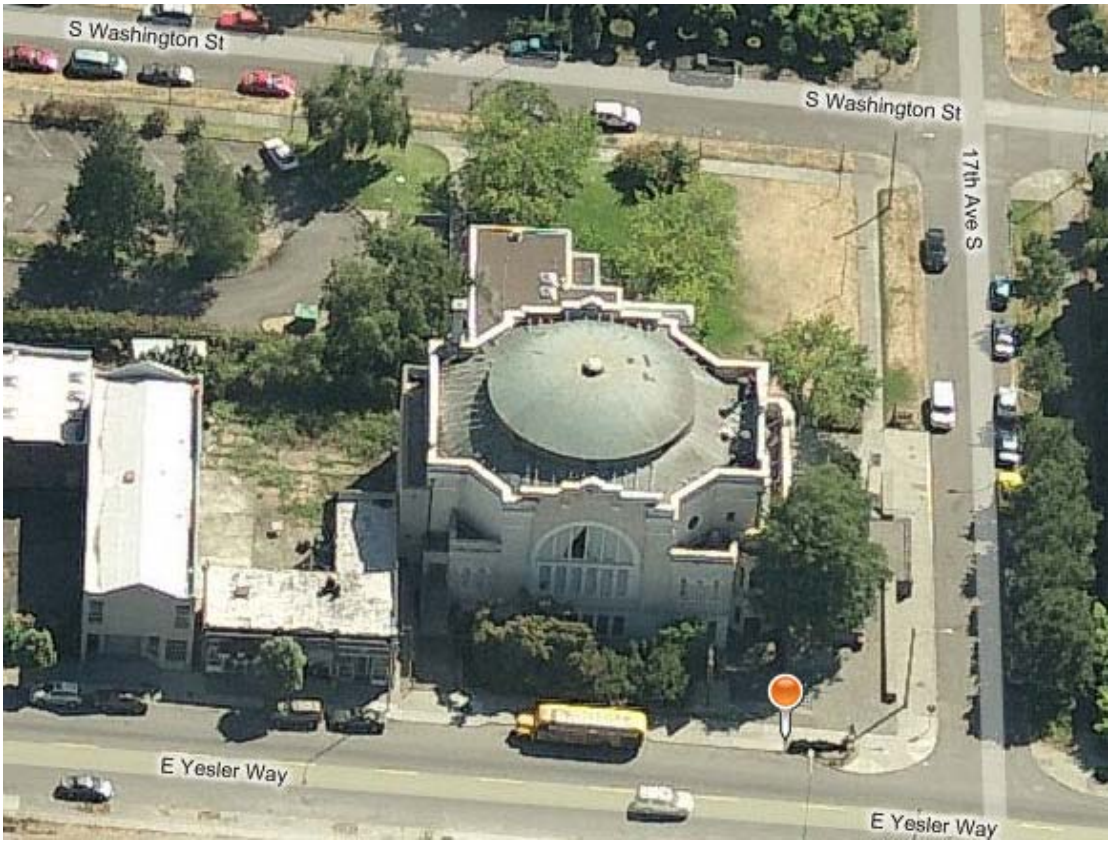
(Microsoft Bing Map: www.maps.live.com)



## APPENDIX Q

**BIRD'S EYE VIEW OF THE ORTHODOX JEWISH CONGREGATION, SEATTLE, WA**

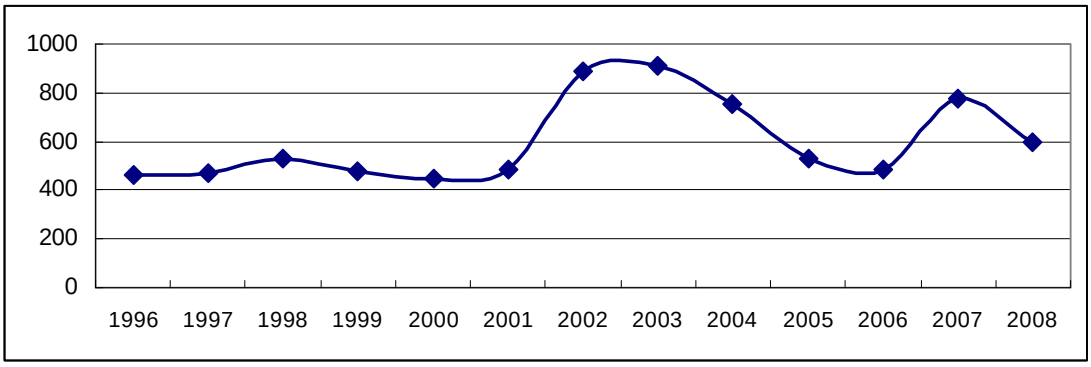
(Microsoft Bing Map: www.maps.live.com)



## APPENDIX R

### TREND OF SINGLE-FAMILY HOUSE BUILDING PERMITS

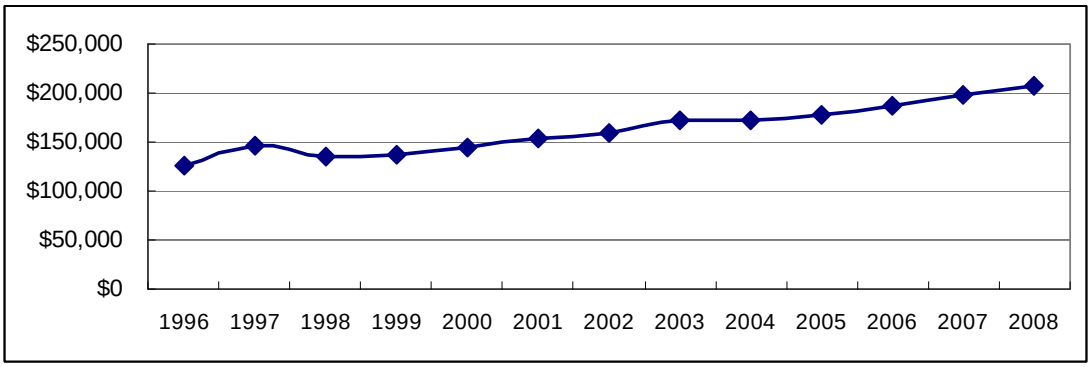
(City-Data.com)



## APPENDIX S

### TREND OF AVERAGE COST TO BUILD A HOUSE

(City-Data.com)



# APPENDIX T

## THE CHANGES OF CONGREGATION BY US STATES

| STATES | 1980 | 1990 | 2000 | Congregations per person | People Per Congregation | Congregations Increase Rate | Congregations Net Change |
|---|---|---|---|---|---|---|---|
| ALABAMA | 7,744 | 8,447 | 8,343 | 0.00188 | 533 | 7.2% (41) | 599 (24) |
| ALASKA | 507 | 814 | 856 | 0.00137 | 732 | 40.8% (4) | 349 (35) |
| ARIZONA | 2,046 | 2,766 | 3,307 | 0.00064 | 1551 | 38.1% (6) | 1,261 (11) |
| ARKANSAS | 5,337 | 5,209 | 5,802 | 0.00217 | 461 | 8% (38) | 465 (29) |
| CALIFORNIA | 11,215 | 14,427 | 16,920 | 0.00050 | 2002 | 33.7% (7) | 5705 (1) |
| COLORADO | 2,298 | 2,813 | 3,228 | 0.00075 | 1332 | 28.8% (9) | 930 (17) |
| CONNECTICUT | 1,710 | 1,944 | 1,955 | 0.00057 | 1742 | 12.5% (28) | 245 (39) |
| D.C. | 363 | 343 | 390 | 0.00068 | 1467 | 6.9% (43) | 27 (49) |
| DELAWARE | 571 | 523 | 571 | 0.00073 | 1372 | 0% (50) | 0 (50) |
| FLORIDA | 6,150 | 8,577 | 10,078 | 0.00063 | 1586 | 39% (5) | 3,928 (2) |
| GEORGIA | 7,134 | 8,300 | 8,962 | 0.00109 | 913 | 20.4% (16) | 1,828 (6) |
| HAWAII | 546 | 758 | 939 | 0.00078 | 1290 | 41.9% (3) | 393 (33) |
| IDAHO | 1,344 | 1,600 | 1,855 | 0.00143 | 698 | 27.5% (10) | 511 (27) |
| ILLINOIS | 9,135 | 9,799 | 10,139 | 0.00082 | 1225 | 9.9% (32) | 1,004 (16) |
| INDIANA | 6,374 | 7,134 | 7,491 | 0.00123 | 812 | 14.9% (22) | 1,117 (13) |
| IOWA | 4,386 | 4,560 | 4,584 | 0.00157 | 638 | 4.3% (46) | 198 (40) |
| KANSAS | 3,680 | 3,958 | 3,959 | 0.00147 | 679 | 7% (42) | 279 (38) |
| KENTUCKY | 6,563 | 7,255 | 7,143 | 0.00177 | 566 | 8.1% (37) | 580 (25) |
| LOUISIANA | 3,782 | 4,025 | 4,158 | 0.00093 | 1075 | 9% (35) | 376 (34) |
| MAINE | 1,270 | 1,336 | 1,301 | 0.00102 | 980 | 2.4% (48) | 31 (48) |
| MARYLAND | 3,030 | 3,519 | 3,855 | 0.00073 | 1374 | 21.4% (14) | 825 (19) |
| MASSACHUSETTS | 2,918 | 3,382 | 3,532 | 0.00056 | 1798 | 17.4% (20) | 614 (23) |
| MICHIGAN | 6,424 | 7,229 | 7,525 | 0.00076 | 1321 | 14.6% (23) | 1,101 (14) |
| MINNESOTA | 4,705 | 4,981 | 5,114 | 0.00104 | 962 | 8% (39) | 409 (32) |
| MISSISSIPPI | 5,090 | 5,433 | 5,505 | 0.00194 | 517 | 7.5% (40) | 415 (31) |
| MISSOURI | 7,428 | 7,666 | 7,771 | 0.00139 | 720 | 4.4% (44) | 343 (36) |
| MONTANA | 1,203 | 1,415 | 1,543 | 0.00171 | 585 | 22% (13) | 340 (37) |
| NEBRASKA | 2,515 | 2,629 | 2,612 | 0.00153 | 655 | 3.7% (47) | 97 (43) |
| NEVADA | 475 | 664 | 937 | 0.00047 | 2133 | 49.3% (1) | 462 (30) |
| NEW HAMPSHIRE | 760 | 896 | 872 | 0.00071 | 1417 | 12.8% (26) | 112 (42) |
| NEW JERSEY | 3,665 | 4,183 | 4,531 | 0.00054 | 1857 | 19.1% (18) | 866 (18) |
| NEW MEXICO | 1,543 | 1,824 | 2,026 | 0.00111 | 898 | 23.8% (11) | 483 (28) |
| NEW YORK | 8,853 | 10,878 | 10,999 | 0.00058 | 1725 | 19.5% (17) | 2,146 (4) |
| NORTH CAROLINA | 10,031 | 11,331 | 11,132 | 0.00138 | 723 | 9.9% (33) | 1,101 (15) |
| NORTH DAKOTA | 1,635 | 1,622 | 1,507 | 0.00235 | 426 | -8.5% (51) | -128 (51) |
| OHIO | 9,732 | 11,086 | 11,166 | 0.00098 | 1017 | 12.8% (27) | 1,434 (7) |
| OKLAHOMA | 5,205 | 5,707 | 5,854 | 0.00170 | 589 | 11.1% (30) | 649 (22) |
| OREGON | 2,501 | 2,908 | 3,155 | 0.00092 | 1084 | 20.7% (15) | 654 (21) |
| PENNSYLVANIA | 11,872 | 13,284 | 13,104 | 0.00107 | 937 | 9.4% (34) | 1,232 (12) |

| STATES | 1980 | 1990 | 2000 | Congregations per person | People Per Congregation | Congregations Increase Rate | Congregations Net Change |
|---|---|---|---|---|---|---|---|
| RHODE ISLAND | 491 | 554 | 572 | 0.00055 | 1833 | 14.2% (24) | 81 (44) |
| SOUTH CAROLINA | 4,832 | 5,509 | 5,522 | 0.00138 | 727 | 12.5% (29) | 690 (20) |
| SOUTH DAKOTA | 1,636 | 1,781 | 1,712 | 0.00227 | 441 | 4.4% (45) | 76 (45) |
| TENNESSEE | 8,309 | 9,246 | 9,634 | 0.00169 | 591 | 13.8% (25) | 1,325 (10) |
| TEXAS | 15,628 | 16,961 | 18,466 | 0.00089 | 1129 | 15.4% (21) | 2,838 (3) |
| UTAH | 2,419 | 3,319 | 4,343 | 0.00194 | 514 | 44.3% (2) | 1,924 (5) |
| VERMONT | 705 | 764 | 775 | 0.00127 | 786 | 9% (36) | 70 (46) |
| VIRGINIA | 6,310 | 7,490 | 7,736 | 0.00109 | 915 | 18.4% (19) | 1,426 (8) |
| WASHINGTON | 3,305 | 4,092 | 4,649 | 0.00079 | 1268 | 28.9% (8) | 1,344 (9) |
| WEST VIRGINIA | 4,103 | 4,443 | 4,139 | 0.00229 | 437 | 0.9% (49) | 36 (47) |
| WISCONSIN | 4,623 | 5,023 | 5,181 | 0.00097 | 1035 | 10.8% (31) | 558 (26) |
| WYOMING | 610 | 766 | 790 | 0.00160 | 625 | 22.8% (12) | 180 (41) |

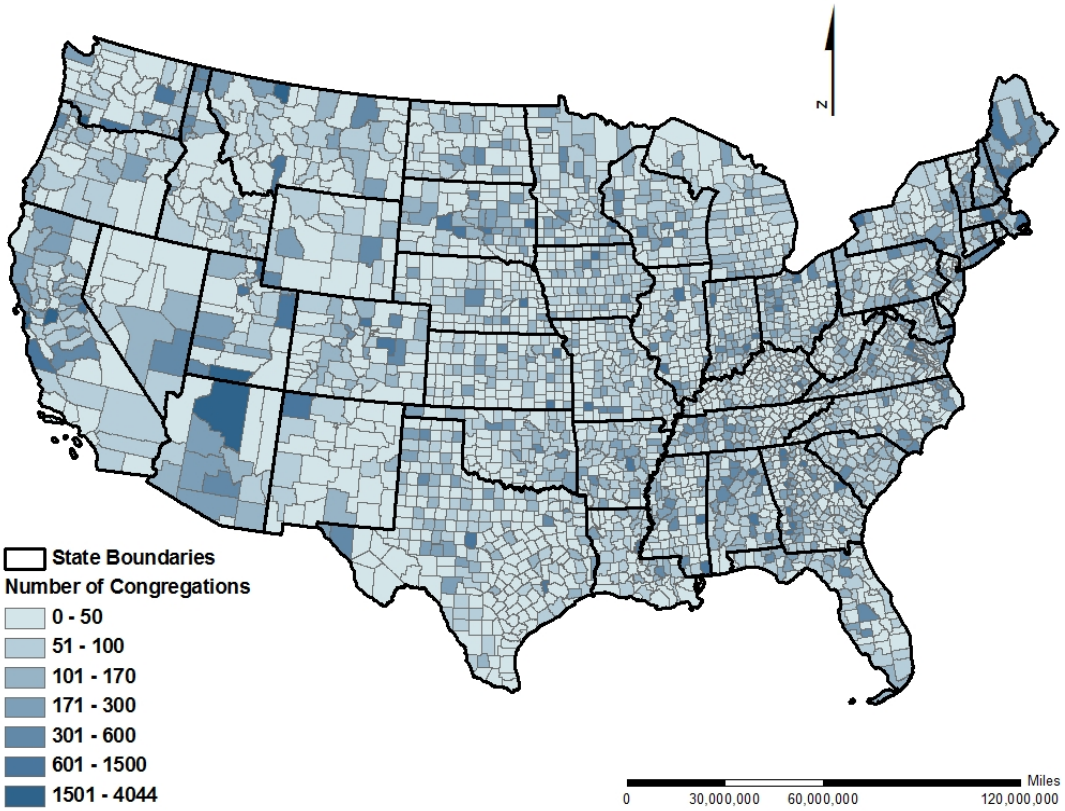
Source: Simons, Ledebur and DeWine (Forthcoming); originally from ARDA
Note:

1. Top 5 states of each column are highlighted.
2. Rankings of the increase rate and the net change are in parentheses.

The number of congregations per person shows little relationship to the outright numbers of congregations. For example, no states which have large number of religious entities are included in the top 10 for congregations per person. The state with the highest ratio of churches per person is North Dakota with .00235 (one for every 435 people), followed by West Virginia (.0023) and South Dakota with (0.0023). The tenth highest is Oklahoma with a ratio of .0017 (one church for every 588 people) and the twentieth highest is Alaska with a ratio of .0014.

## APPENDIX U

## THE NUMBER OF CONGREGATIONS BY COUNTY




Source: Simons, Ledebur and DeWine (Forthcoming); originally from ARDA

## APPENDIX V

## DESCRIPTIVE STATISTICS OF CONTINUOUS VARIABLES BY REUSE OUTCOMES

| Variables | Condo | | Office | | Retail | | Low Income Housing | | School | | Cultural | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | S. D | Mean | S. D | Mean | S. D | Mean | S. D | Mean | S. D | Mean | S. D |
| BLDFTPRINT | 16041.19 | 18486.01 | 8276.78 | 7008.63 | 10782.27 | 8898.51 | 3777.45 | 2483.74 | 21671.30 | 19997.64 | 20999.41 | 32001.06 |
| BLDSIZE | 42267.78 | 60130.81 | 15225.83 | 15049.53 | 17623.18 | 16153.62 | 44547.14 | 41195.89 | 38168.98 | 42979.29 | 42594.29 | 62319.93 |
| LOTSIZE | 90268.06 | 328945.86 | 55613.30 | 92058.81 | 64073.43 | 127953.06 | 40896.67 | 39837.04 | 141685.23 | 166927.98 | 73895.58 | 106626.89 |
| FAR | .51 | .27 | .33 | .26 | .46 | .31 | .57 | .28 | .37 | .31 | .50 | .30 |
| STORY | 2.37 | 1.26 | 1.83 | .93 | 1.65 | .84 | 2.59 | .81 | 1.88 | 1.08 | 2.23 | .75 |
| AGE | 87.10 | 32.48 | 66.27 | 27.72 | 69.62 | 33.22 | 78.73 | 17.92 | 55.67 | 26.77 | 85.31 | 46.04 |
| PARK | .53 | .82 | 1.66 | 3.94 | 1.28 | 2.48 | .64 | .61 | .34 | .40 | .46 | .32 |
| LAKE | 1.99 | 4.13 | 1.90 | 3.25 | 2.09 | 2.44 | 1.50 | 1.20 | 2.57 | 3.37 | 1.93 | 1.89 |
| HIGHWAY | 2.36 | 4.47 | 1.36 | 1.54 | 1.41 | 2.85 | 1.23 | 1.07 | 1.45 | 1.29 | 1.23 | 1.35 |
| POPCHANGE | .06 | .21 | .05 | .18 | .05 | .14 | .00 | .15 | .04 | .15 | .06 | .16 |
| WHITECHANGE | -4.95% | 44.44% | -5.22% | 43.82% | -1.53% | 51.68% | -13.07% | 29.93% | -12.73% | 45.23% | 6.52% | 31.78% |
| BACHECHANGE | 10.52% | 13.73% | 9.00% | 14.67% | 6.51% | 12.38% | 2.78% | 7.46% | 2.01% | 13.12% | 11.07% | 18.19% |
| INCOMECHANGE | 44.24% | 27.38% | 48.37% | 31.31% | 41.02% | 26.79% | 33.34% | 19.66% | 39.79% | 22.46% | 52.41% | 39.88% |
| OWNERCHANGE | 0.80% | 6.00% | 0.45% | 5.59% | 0.99% | 4.22% | 0.83% | 3.37% | 1.83% | 4.25% | 2.19% | 5.63% |
| RETAILOCCUPATION | -3.95% | 2.73% | -4.01% | 2.05% | -4.34% | 3.40% | -2.37% | 10.28% | -6.31% | 5.82% | -4.32% | 2.76% |
| OFFICEOCCUPATION | -5.04% | 11.85% | -6.59% | 9.53% | -3.02% | 8.23% | -1.92% | 10.49% | 0.49% | 6.12% | -2.60% | 4.34% |
| UNEMPLOYMENT | 4.95 | .63 | 4.98 | .48 | 5.14 | .82 | .05 | .00 | 5.10 | .51 | 5.17 | .59 |
| TBILL | 3.93 | 1.06 | 3.52 | 1.32 | 3.27 | 1.52 | .03 | .00 | 3.18 | 1.32 | 3.20 | .31 |
| N | 52 | | 26 | | 42 | | 22 | | 24 | | 41 | |

## APPENDIX W

## FREQUENCIES OF BINARY VARIABLES BY REUSE OUTCOMES

| Variables | Condo | | Office | | Retail | | Low Income Housing | | School | | Cultural | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Frequency | Percent | Frequency | Percent | Frequency | Percent | Frequency | Percent | Frequency | Percent | Frequency | Percent |
| STEEPLE | 21 | 40.38% | 9 | 34.62% | 17 | 40.48% | 13 | 59.1% | 8 | 33.33% | 16 | 39.02% |
| BLUFF_STONE | 9 | 17.31% | 3 | 11.54% | 7 | 16.67% | 4 | 18.2% | 4 | 16.67% | 12 | 29.27% |
| RED_BRICK | 30 | 57.69% | 13 | 50.00% | 17 | 40.48% | 15 | 68.2% | 13 | 54.17% | 15 | 36.59% |
| MAIN_ST | 20 | 38.46% | 16 | 61.54% | 34 | 80.95% | 10 | 45.5% | 11 | 45.83% | 20 | 48.78% |
| CENTRALCITY | 34 | 65.38% | 17 | 65.38% | 27 | 64.29% | 15 | 68.2% | 15 | 62.50% | 30 | 73.17% |
| HIFAITH | 14 | 26.92% | 8 | 30.77% | 6 | 14.29% | 9 | 40.9% | 5 | 20.83% | 6 | 14.63% |
| HISLNDMARK | 3 | 5.77% | 2 | 7.69% | 3 | 7.14% | 1 | 4.5% | 0 | 0.00% | 7 | 17.07% |
| HISDISTRICT | 3 | 5.77% | 1 | 3.85% | 2 | 4.76% | 0 | 0.0% | 0 | 0.00% | 3 | 7.32% |
| HPTC | 0 | 0.00% | 2 | 7.69% | 3 | 7.14% | 7 | 31.8% | 0 | 0.00% | 0 | 0.00% |
| LIHTC | 0 | 0.00% | 0 | 0.00% | 0 | 0.00% | 7 | 31.8% | 0 | 0.00% | 0 | 0.00% |
| NMTC | 0 | 0.00% | 0 | 0.00% | 6 | 14.29% | 0 | 0.0% | 0 | 0.00% | 0 | 0.00% |
| N | 52 | | 26 | | 42 | | 22 | | 24 | | 41 | |

# APPENDIX X

## MODEL SPECIFICATION

| Explanatory Variables | Model 1 | Model 2 | Model 3 | Model4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| ***Building Characteristics*** | | | | | | | |
| LNBLDFTPRINT | | | | * | | * | * |
| LNBLDSIZE | | | | | * | | |
| LNLOTSIZE | | | | * | | * | * |
| FAR | | | | * | * | * | * |
| STORY | | | | * | * | * | * |
| AGE | | | | * | * | * | * |
| STEEPLE | | | | | * | | |
| BLUFF_STONE | | | | * | | * | * |
| RED_BRICK | | | | | * | | |
| ***Location Characteristics*** | | | | | | | |
| PARK | | | * | * | * | * | * |
| LAKE | | | * | * | * | * | * |
| HIGHWAY | | | * | * | * | * | * |
| MAIN_ST | | | * | * | * | * | * |
| CENTRALCITY | | | * | * | * | * | * |
| MA | | | * | * | * | * | * |
| CA | | | * | * | * | * | * |
| NY | | | * | * | * | * | * |
| FL | | | * | * | * | * | * |
| TX | | | * | * | * | * | * |
| ***Demographic Sifts*** | | | | | | | |
| POPCHANGE | * | * | * | * | * | * | * |
| INCOMECHANGE | * | * | * | | * | | |
| OWNERCHANGE | * | * | * | * | | * | * |
| EDUCHANGE | * | * | * | * | * | * | * |
| ***Local commercial market Condition*** | | | | | | | |
| RETAIL | | * | * | * | * | * | * |
| OFFICEOCCUPATION | | * | * | * | * | * | * |
| ***Macro Economic*** | | | | | | | |
| UNEMPLOYMENT | * | * | * | * | * | * | * |
| TBILL | * | * | * | * | * | * | * |
| ***Sellers' Denomination*** | | | | | | | |
| HIFAITH | | * | * | * | * | * | * |
| ***Historic Designation*** | | | | | | | |
| HISLNDMARK | | * | * | * | * | * | * |
| HISDISTRICT | | * | * | * | | * | * |
| ***Tax Credits*** | | | | | | | |
| HPTC | * | * | * | * | | * | * |
| LIHTC | * | * | * | | * | | |
| NMTC | * | * | * | * | | * | * |

1. Observations of Model 1 to Model 5 are 341. Theses models include all observations in the sample
2. Observations of Model 6 are 289. Model 6 only includes religious buildings which were redeveloped after 1990.
3. Tax credit variables – HPTC LIHTC NMTC – in Model 1 to Model are dummy variables indicating uses of tax credits, but in Model 7 they are the actual dollar amounts that were put for the project.

## APPENDIX Y

## CORRELATION MATRIX OF CONTINUOUS VARIABLES (PEARSON'S CORRELATION)

| Variables | LNBLDFTPRINT | LNBLDSIZE | LNLOTSIZE | FAR | STORY | AGE | PARK | LAKE | HIGHWAY | POP | INCOME | OWNER | EDU | RETAIL | OFFICE | UNEMPLOYMENT | TBILL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LNBLDFTPRINT | 1 | | | | | | | | | | | | | | | | |
| LNBLDSIZE | .874** | 1 | | | | | | | | | | | | | | | |
| LNLOTSIZE | .657** | .437** | 1 | | | | | | | | | | | | | | |
| FAR | -0.041 | .176** | -.675** | 1 | | | | | | | | | | | | | |
| STORY | -0.088 | .369** | -.341** | .437** | 1 | | | | | | | | | | | | |
| AGE | -.232** | -0.043 | -.501** | .457** | .384** | 1 | | | | | | | | | | | |
| PARK | -0.025 | -.131* | .152** | -.210** | -.158** | -.144** | 1 | | | | | | | | | | |
| LAKE | -0.037 | -.115* | .117* | -.184** | -.164** | -.119* | .282** | 1 | | | | | | | | | |
| HIGHWAY | 0.067 | -0.07 | .177** | -.147** | -.149** | -.184** | .134* | .225** | 1 | | | | | | | | |
| POPCHANGE | 0.096 | 0.043 | .210** | -.187** | -.109* | -.152** | 0.097 | -0.029 | 0.031 | 1 | | | | | | | |
| INCOMECHANGE | -0.023 | -0.009 | -0.079 | 0.095 | 0.054 | 0.097 | 0.009 | 0.053 | -0.034 | 0.015 | 1 | | | | | | |
| OWNERCHANGE | -0.053 | -0.009 | -0.091 | .132* | .116* | 0.032 | 0.006 | 0.004 | -0.025 | -.122* | .441** | 1 | | | | | |
| EDUCHANGE | 0.09 | 0.051 | .130* | -0.053 | -0.06 | -0.058 | 0.000 | -0.006 | 0.054 | -0.002 | .152** | 0.065 | 1 | | | | |
| RETAIL | 0.024 | -0.006 | -0.035 | .108* | -0.053 | 0.017 | 0.016 | -0.009 | -0.002 | 0.017 | 0.026 | 0.083 | -0.017 | 1 | | | |
| OFFICE | -.112* | -0.049 | -0.103 | 0.052 | .130* | .168** | 0.002 | -0.086 | -0.015 | -0.006 | 0.062 | 0.001 | 0.006 | -0.027 | 1 | | |
| UNEMPLOYMENT | 0.051 | 0.04 | -0.019 | 0.011 | -0.023 | 0.003 | -0.002 | -0.047 | -0.058 | -0.05 | -0.013 | -0.039 | -0.05 | -0.029 | 0.001 | 1 | |
| TBILL | -0.103 | -.121* | 0.01 | -0.016 | -0.018 | -0.049 | -0.035 | -0.001 | .108* | 0.072 | 0.008 | -0.006 | 0.087 | 0.053 | 0.004 | -.494** | 1 |

Note: *, ** and *** denote statistical significant at the 90%, 95% and 99%, respectively.

## APPENDIX Z

## CORRELATION MATRIX OF BINARY VARIABLES

| Variables | STEEPLE | BLUFF_STONE | RED_BRICK | MAIN_ST | CENTRALCITY | MA | CA | NY | FL | TX | HIFAITH | HISLNDMARK | HISDISTRICT | HPTC | LIHTC | NMTC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STEEPLE | 1 | | | | | | | | | | | | | | | |
| BLUFF_STONE | 0.392*** | 1 | | | | | | | | | | | | | | |
| RED_BRICK | 0.028 | -0.376** | 1 | | | | | | | | | | | | | |
| MAIN_ST | -0.057 | -0.077* | 0.013 | 1 | | | | | | | | | | | | |
| CENTRALCITY | 0.146** | 0.223*** | 0.019 | 0.010 | 1 | | | | | | | | | | | |
| MA | 0.074 | -0.007 | 0.171** | -0.069 | -0.123* | 1 | | | | | | | | | | |
| CA | -0.005 | -0.076 | -0.102* | 0.021 | -0.023 | -0.125* | 1 | | | | | | | | | |
| NY | 0.123** | 0.122* | 0.110* | -0.005 | -0.002 | -0.114* | -0.097* | 1 | | | | | | | | |
| FL | -0.089 | -0.085 | -0.065 | 0.019 | -0.065 | -0.120* | -0.093 * | -0.085* | 1 | | | | | | | |
| TX | -0.087 | -0.107 | -0.026 | 0.049 | 0.063 | -0.100 | -0.085* | -0.078* | -0.075* | 1 | | | | | | |
| HIFAITH | 0.174** | 0.177* | 0.038 | -0.087* | 0.049 | 0.092* | -0.076* | -0.001 | -0.106* | -0.061 | 1 | | | | | |
| HISLNDMARK | 0.148** | 0.214** | 0.005 | -0.033 | 0.100* | -0.047 | 0.017 | 0.079** | -0.015 | -0.005 | 0.137** | 1 | | | | |
| HISDISTRICT | 0.151** | 0.037 | 0.068 | -0.069 | 0.094* | 0.101 | -0.053 | -0.049* | -0.047 | -0.043 | 0.065* | -0.037 | 1 | | | |
| HPTC | 0.163** | 0.127* | 0.076* | -0.018 | 0.1658 | 0.009 | -0.017 | -0.008 | -0.059 | -0.054 | 0.171** | 0.225** | 0.151** | 1 | | |
| LIHTC | 0.070 | -0.059 | 0.032 | -0.033 | -0.012 | 0.130 | -0.047 | -0.043 | -0.041 | -0.038 | 0.040 | 0.062 | -0.024 | 0.283** | 1 | |
| NMTC | 0.070 | 0.177* | -0.050 | 0.049 | 0.115* | -0.055 | 0.023 | 0.032 | -0.041 | -0.038 | 0.040 | 0.157 | -0.024 | 0.075 | -0.021 | 1 |

Note: *, ** and *** denote statistical significant at the 90%, 95% and 99%, respectively.

## APPENDIX AA

## RESULTS OF THE BINARY LOGIT REGRESSION ANALYSIS

| Variables | Coefficient | Std. Error | z-value | p-value |
|---|---|---|---|---|
| LNBLDSIZE | -0.90 | 0.30 | -2.98 | 0.00 |
| LNLOTSIZE | 0.22 | 0.29 | 0.76 | 0.45 |
| FAR | 1.47 | 1.13 | 1.30 | 0.20 |
| STORY | 0.42 | 0.27 | 1.58 | 0.11 |
| AGE | 0.01 | 0.01 | 2.02 | 0.04 |
| BLUFF_STONE | 0.19 | 0.56 | 0.34 | 0.73 |
| RED_BRICK | 0.22 | 0.33 | 0.67 | 0.50 |
| PARK | 0.10 | 0.10 | 0.92 | 0.36 |
| LAKE | 0.00 | 0.05 | -0.09 | 0.93 |
| HIGHWAY | 0.05 | 0.07 | 0.80 | 0.43 |
| MAIN_ST | 0.08 | 0.31 | 0.25 | 0.81 |
| CENTRALCITY | 0.76 | 0.33 | 2.31 | 0.02 |
| MA | 1.34 | 0.68 | 1.99 | 0.05 |
| CA | -0.21 | 0.49 | -0.44 | 0.66 |
| NY | 1.32 | 0.64 | 2.06 | 0.04 |
| FL | -0.87 | 0.60 | -1.44 | 0.15 |
| TX | -0.04 | 0.57 | -0.07 | 0.95 |
| POPCHANGE | -1.84 | 0.92 | -2.00 | 0.05 |
| INCOMECHANGE | 0.26 | 0.75 | 0.34 | 0.73 |
| OWNERCHANGE | 7.44 | 4.20 | 1.77 | 0.08 |
| EDUCHANGE | -2.14 | 1.04 | -2.06 | 0.04 |
| RETAIL | -0.67 | 0.85 | -0.79 | 0.43 |
| OFFICE | -0.38 | 0.55 | -0.59 | 0.57 |
| UNEMPLOYMENT | -77.49 | 34.61 | -2.24 | 0.03 |
| TBILL | -26.03 | 19.22 | -1.35 | 0.18 |
| HIFAITH | 0.53 | 0.44 | 1.21 | 0.23 |
| HISLNDMARK | 1.48 | 1.24 | 1.19 | 0.23 |

Note:

1. Pseudo R Squared: 0.36
2. Log Likelihood -1440.2

## APPENDIX BB

## REDUCED FORM BINARY LOGIT MODEL

$$\ln\left(\frac{\text{prob}_{\text{initiate}}}{1-\text{prob}_{\text{initiator}}}\right) = \delta_0 + \delta_1 \text{BLD} + \delta_2 \text{LO} + \delta_3 \text{DM} + \delta_4 \text{MC} + \delta_5 \text{ME} + \delta_6 \text{SEL} + \delta_7 \text{HPL} + \delta_8 \text{TC}$$

Above equation is a logit equation. Where, the probability reusing religious buildings are affected by following vectors:

| | | |
|---|---|---|
| *BLD* | = | a vector indicating building characteristics |
| *LO* | = | a vector indicating location characteristics |
| *DM* | = | a vector indicating demographic shifts |
| *MC* | = | a vector indicating local commercial market conditions |
| *ME* | = | a vector indicating macro economic trends |
| *SEL* | = | a dummy variable indicating hierarchical sellers |
| *HPL* | = | a vector indicating historic designation |

## APPENDIX CC

## THE MULTINOMIAL LOGIT REGRESSION RESULTS 2, "CHURCH TO CHURCH" AND "OFFICE"

| Variables | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | | Model 6 | | Model 7 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value |
| ***Building Characteristics*** | | | | | | | | | | | | | | |
| LNBLDFTPRINT | | | | | | | -1.75 | -2.73** | | | -1.89 | -2.87*** | -1.75 | -2.73*** |
| LNBLDSIZE | | | | | | | | | -1.84 | -4.52*** | | | | |
| LNLOTSIZE | | | | | | | -0.12 | -0.21 | | | -0.06 | -0.10 | -0.12 | -0.21 |
| FAR | | | | | | | 1.09 | 0.47 | 1.71 | 1.21 | 1.60 | 0.67 | 1.09 | 0.47 |
| STORY | | | | | | | -0.34 | -0.84 | 0.62 | 1.49 | -0.46 | -1.11 | -0.34 | -0.84 |
| AGE | | | | | | | 0.00 | -0.36 | 0.00 | -0.25 | 0.00 | -0.33 | 0.00 | -0.36 |
| STEEPLE | | | | | | | | | -0.16 | -0.23 | | | | |
| BLUFF_STONE | | | | | | | -1.06 | -0.95 | | | -0.64 | -0.54 | -1.06 | -0.95 |
| RED_BRICK | | | | | | | -0.12 | -0.18 | | | 0.03 | 0.04 | -0.12 | -0.18 |
| ***Location Characteristics*** | | | | | | | | | | | | | | |
| PARK | | | | | 0.55 | 2.74*** | 0.75 | 2.97*** | 0.29 | 2.84*** | 0.71 | 2.90*** | 0.75 | 2.97*** |
| LAKE | | | | | -0.23 | -1.38 | -0.25 | -1.44 | -0.09 | -1.67* | -0.24 | -1.37 | -0.25 | -1.44 |
| HIGHWAY | | | | | -0.07 | -0.44 | -0.09 | -0.43 | 0.42 | -0.48 | -0.08 | -0.38 | -0.09 | -0.43 |
| MAIN_ST | | | | | 0.28 | 0.51 | 0.38 | 0.60 | 1.82 | 0.67 | 0.34 | 0.53 | 0.38 | 0.60 |
| CENTRALCITY | | | | | 1.15 | 1.96** | 1.84 | 2.56*** | 2.18 | 2.57*** | 1.79 | 2.47** | 1.84 | 2.56** |
| MA | | | | | 2.01 | 2.02** | 2.31 | 1.94* | -0.66 | -0.59 | 2.24 | 1.85* | 2.31 | 1.948** |
| CA | | | | | -1.00 | -0.98 | -0.70 | -0.62 | 0.60 | 0.53 | -0.81 | -0.71 | -0.70 | -0.62 |
| NY | | | | | 1.19 | 1.13 | 0.74 | 0.64 | -2.83 | -1.56 | 0.64 | 0.54 | 0.74 | 0.64 |
| FL | | | | | -2.65 | -1.96** | -3.16 | -1.60 | -36.27 | 0.00 | -2.89 | -1.51 | -3.16 | -1.60 |

| Variables | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | | Model 6 | | Model 7 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value |
| TX | | | | | -36.35 | 0.00 | -45.39 | . | | | | | | |
| ***Demographic Sifts*** | | | | | | | | | | | | | | |
| POPCHANGE | -3.00 | -1.91* | -2.87 | -1.78* | -3.24 | -1.75* | -3.21 | -1.59 | -3.00 | -1.47 | -3.21 | -1.62 | -3.21 | -1.59 |
| INCOMECHANGE | 1.75 | 1.69* | 1.77 | 1.64 | 1.42 | 1.23 | 1.92 | 1.32 | 1.56 | 1.12 | 1.52 | 1.01 | 1.92 | 1.32 |
| OWNERCHANGE | -0.46 | -0.08 | 2.85 | 0.45 | 2.79 | 0.39 | 0.03 | 0.00 | 1.30 | 0.16 | -0.37 | -0.05 | 0.02 | 0.00 |
| EDUCHANGE | -2.59 | -1.58 | -3.11 | -1.81* | -2.11 | -1.14 | -0.80 | -0.37 | -0.89 | -0.42 | -1.07 | -0.48 | -0.79 | -0.37 |
| ***Commercial Market Condition*** | | | | | | | | | | | | | | |
| RETAIL | | | -0.07 | -0.13 | -0.75 | -0.57 | -1.11 | -0.73 | -1.22 | -0.84 | -1.37 | -0.88 | -1.11 | -0.73 |
| OFFICE | | | 4.36 | 0.70 | 6.28 | 0.90 | 6.31 | 0.78 | 5.21 | 0.66 | 6.90 | 0.82 | 6.32 | 0.78 |
| ***Macro Economic*** | | | | | | | | | | | | | | |
| UNEMPLOYMENT | -40.12 | -1.12 | -46.97 | -1.28 | -0.75 | -0.57 | -81.65 | -1.58 | -83.28 | -1.74* | -115.20 | -1.72* | -81.59 | -1.58 |
| TBILL | -20.24 | -0.90 | -25.29 | -1.10 | 6.28 | 0.90 | -41.13 | -1.34 | -43.97 | -1.50 | -63.75 | -1.76* | -41.11 | -1.34 |
| ***Sellers' Denomination*** | | | | | | | | | | | | | | |
| HIFAITH | | | 1.21 | 2.07** | 0.91 | 1.44 | 1.11 | 1.47 | 1.07 | 1.41 | 1.01 | 1.32 | 1.11 | 1.47 |
| ***Historic Designation*** | | | | | | | | | | | | | | |
| HISLNDMARK | | | 1.44 | 0.86 | 1.74 | 0.99 | 2.11 | 1.04 | 1.82 | 0.92 | 1.54 | 0.80 | 2.11 | 1.04 |
| HISDISTRICT | | | 24.04 | 15.63** | 22.44 | 14.34*** | 23.52 | . | 23.06 | 15.74*** | 23.96 | . | 23.54 | . |
| ***Tax Credits*** | | | | | | | | | | | | | | |
| HPTC | 24.17 | 18.32*** | 23.86 | 13.28*** | 25.02 | 13.24*** | 24.20 | 9.31*** | 24.01 | 9.56*** | 25.34 | 9.62*** | 0.84 | 1.99** |
| LIHTC | -4.42 | 0.00 | -39.93 | . | -40.32 | . | -16.12 | . | -30.45 | 0.00 | -10.43 | . | -0.33 | -0.65 |
| NMTC | -13.37 | 0.00 | -15.73 | 0.00 | -20.09 | . | -19.26 | . | -17.32 | 0.00 | -18.44 | 0.00 | 0.01 | . |
| Log Likelihood | -580.78 | | -543.40 | | -456.56 | | -388.02 | | -404.50 | | -370.84 | | -388.00 | |
| Pseudo R Squared | 0.15 | | 0.20 | | 0.33 | | 0.43 | | 0.40 | | 0.44 | | 0.43 | |

Note:
1. *, ** and *** denotes statistical significance at the 90%, 95% and 99% level of confidence, respectively.
2. Observations of Model 1 to Model 5 are 341. Theses models include all observations in the sample
3. Observations of Model 6 are 289. Model 6 only includes religious buildings which were redeveloped after 1990.
4. Tax credit variables – HPTC LIHTC NMTC – in Model 1 to Model are dummy variables indicating uses of tax credits, but in Model 7 they are the actual dollar amounts that were put for the project.

## APPENDIX DD

## THE MULTINOMIAL LOGIT REGRESSION RESULTS 3, "CHURCH TO CHURCH" AND "RETAIL"

| Independent Variables | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | | Model 6 | | Model 7 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value |
| ***Building Characteristics*** | | | | | | | | | | | | | | |
| LNBLDFTPRINT | | | | | | | 0.56 | -2.39** | | | -1.39 | -2.45** | -1.32 | -2.39** |
| LNBLDSIZE | | | | | | | | | -1.48 | -4.30*** | | | | |
| LNLOTSIZE | | | | | | | -0.01 | -0.01 | | | -0.05 | -0.09 | -0.01 | -0.01 |
| FAR | | | | | | | 3.86 | 1.95* | 4.10 | 3.50*** | 4.25 | 2.05** | 3.86 | 1.95* |
| STORY | | | | | | | -0.77 | -1.97* | -0.08 | -0.19 | -1.06 | -2.50** | -0.77 | -1.97* |
| AGE | | | | | | | 0.00 | 0.27 | 0.00 | 0.07 | 0.00 | 0.19 | 0.00 | 0.27 |
| STEEPLE | | | | | | | | | 0.92 | 1.56 | | | | |
| BLUFF_STONE | | | | | | | -0.58 | -0.58 | | | -0.50 | -0.44 | -0.58 | -0.58 |
| RED_BRICK | | | | | | | 0.07 | 0.13 | | | 0.13 | 0.23 | 0.07 | 0.13 |
| ***Location Characteristics*** | | | | | | | | | | | | | | |
| PARK | | | | | 0.30 | 1.77* | 0.50 | 2.21** | 0.40 | 1.91* | 0.47 | 2.15** | 0.50 | 2.22** |
| LAKE | | | | | 0.00 | 0.03 | -0.01 | -0.11 | -0.02 | -0.13 | -0.02 | -0.21 | -0.01 | -0.11 |
| HIGHWAY | | | | | -0.04 | -0.30 | 0.03 | 0.19 | 0.04 | 0.30 | 0.03 | 0.19 | 0.03 | 0.19 |
| MAIN_ST | | | | | 0.57 | 1.17 | 0.83 | 1.52 | 0.92 | 1.65* | 1.00 | 1.74* | 0.83 | 1.52 |
| CENTRALCITY | | | | | 0.82 | 1.72* | 1.07 | 1.86* | 1.10 | 1.89* | 0.99 | 1.68* | 1.07 | 1.86* |
| MA | | | | | 1.08 | 1.05 | 0.61 | 0.51 | 0.50 | 0.42 | 0.39 | 0.31 | 0.61 | 0.51 |
| CA | | | | | -1.98 | -2.19** | -2.15 | -2.10** | -2.21 | -2.20** | -2.34 | -2.25** | -2.16 | -2.10** |
| NY | | | | | 0.90 | 0.97 | 0.38 | 0.38 | 0.24 | 0.25 | -0.26 | -0.23 | 0.38 | 0.38 |
| FL | | | | | -1.25 | -1.67* | -1.15 | -1.28 | -0.95 | -1.07 | -1.28 | -1.38 | -1.15 | -1.28 |
| TX | | | | | -0.79 | -0.83 | -0.72 | -0.67 | -0.73 | -0.68 | -0.89 | -0.82 | -0.72 | -0.67 |
| ***Demographic Sifts*** | | | | | | | | | | | | | | |
| POPCHANGE | -2.23 | -1.78* | -2.60 | -1.89* | -2.48 | -1.65* | -0.86 | -0.51 | -0.65 | -0.40 | -1.03 | -0.59 | -0.86 | -0.51 |
| INCOMECHANGE | 0.09 | 0.09 | 0.00 | 0.00 | -0.79 | -0.69 | -0.91 | -0.69 | -1.39 | -1.08 | -1.07 | -0.78 | -0.91 | -0.69 |
| OWNERCHANGE | 11.67 | 2.22** | 13.99 | 2.49** | 15.83 | 2.50** | 15.80 | 2.23** | 16.96 | 2.43** | 14.72 | 2.07** | 15.80 | 2.23** |
| EDUCHANGE | -2.45 | -1.70* | -2.61 | -1.74* | -2.31 | -1.45 | -1.94 | -1.06 | -2.06 | -1.15 | -1.86 | -0.96 | -1.94 | -1.06 |

| Independent Variables | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | | Model 6 | | Model 7 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value |
| ***Commercial Market Condition*** | | | | | | | | | | | | | | |
| RETAIL | | | -0.34 | -0.34 | -1.06 | -0.95 | -0.98 | -0.76 | -0.97 | -0.76 | -0.98 | -0.73 | -0.98 | -0.76 |
| OFFICE | | | 6.29 | 1.19 | 10.10 | 1.65* | 11.47 | 1.67* | 12.05 | 1.69* | 13.78 | 1.95* | 11.48 | 1.67* |
| ***Macro Economic*** | | | | | | | | | | | | | | |
| UNEMPLOYMENT | -18.57 | -0.62 | -24.56 | -0.81 | 64.93 | 1.24 | -38.88 | -1.00 | -40.94 | -1.20 | -79.24 | -1.70* | -38.84 | -0.99 |
| TBILL | -32.34 | -1.60 | -37.44 | -1.79* | 111.01 | 2.92** | -65.60 | -2.28** | -67.64 | -2.55** | -93.17 | -2.87*** | -65.58 | -2.27** |
| ***Sellers' Denomination*** | | | | | | | | | | | | | | |
| HIFAITH | | | -0.02 | -0.04 | 0.39 | 0.55 | -0.37 | -0.47 | -0.62 | -0.79 | -0.43 | -0.53 | -0.38 | -0.48 |
| ***Historic Designation*** | | | | | | | | | | | | | | |
| HISLNDMARK | | | 0.83 | 0.44 | 1.36 | 0.72 | 1.24 | 0.63 | 1.21 | 0.64 | 0.83 | 0.44 | 1.24 | 0.63 |
| HISDISTRICT | | | 24.88 | 18.31*** | 23.48 | 16.72*** | 23.44 | 14.50*** | 22.96 | 14.49*** | 23.85 | 14.47*** | 23.45 | 14.49*** |
| ***Tax Credits*** | | | | | | | | | | | | | | |
| HPTC | 24.16 | 19.88*** | 24.35 | 15.56*** | 25.53 | 15.50*** | 25.06 | 12.00*** | 24.81 | 12.16*** | 26.26 | 12.03*** | 0.87 | 2.09** |
| LIHTC | -4.32 | 0.00 | -38.36 | . | -38.78 | . | -14.98 | . | -30.28 | . | -8.87 | . | -0.66 | . |
| NMTC | 25.65 | 19.75*** | 25.90 | 18.68*** | 27.32 | 17.12*** | 27.35 | 12.46*** | 26.43 | 14.77*** | 26.42 | 11.69*** | 1.01 | 2.13** |
| Log Likelihood | -580.78 | | -543.40 | | -456.56 | | -388.02 | | -404.50 | | -370.84 | | -388.00 | |
| Pseudo R Squared | 0.15 | | 0.20 | | 0.33 | | 0.43 | | 0.40 | | 0.44 | | 0.43 | |

Note:

1. *, ** and *** denotes statistical significance at the 90%, 95% and 99% level of confidence, respectively.
2. Observations of Model 1 to Model 5 are 341. Theses models include all observations in the sample
3. Observations of Model 6 are 289. Model 6 only includes religious buildings which were redeveloped after 1990.
4. Tax credit variables – HPTC LIHTC NMTC – in Model 1 to Model are dummy variables indicating uses of tax credits, but in Model 7 they are the actual dollar amounts that were put for the project.

## APPENDIX EE

## THE MULTINOMIAL LOGIT REGRESSION RESULTS 4, "CHURCH TO CHURCH" AND "LOW INCOME HOUSING"

| Independent Variables | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | | Model 6 | | Model 7 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value |
| ***Building Characteristics*** | | | | | | | | | | | | | | |
| LNBLDFTPRINT | | | | | | | -0.48 | -0.42 | | | -0.53 | -0.45 | -0.49 | -0.42 |
| LNBLDSIZE | | | | | | | | | -0.70 | -1.40 | | | | |
| LNLOTSIZE | | | | | | | -0.34 | -0.34 | | | -0.28 | -0.27 | -0.35 | -0.34 |
| FAR | | | | | | | 2.06 | 0.57 | 2.90 | 1.67* | 2.88 | 0.79 | 2.05 | 0.57 |
| STORY | | | | | | | 0.53 | 1.07 | 0.75 | 1.43 | 0.46 | 0.89 | 0.53 | 1.08 |
| AGE | | | | | | | -0.02 | -0.79 | -0.01 | -0.65 | -0.02 | -0.75 | -0.02 | -0.79 |
| STEEPLE | | | | | | | | | 1.62 | 1.79* | | | | |
| BLUFF_STONE | | | | | | | 26.74 | 3.98*** | | | 27.27 | 3.72*** | 28.28 | . |
| RED_BRICK | | | | | | | 27.26 | 4.05*** | | | 27.52 | 3.76*** | 28.80 | 4.36*** |
| ***Location Characteristics*** | | | | | | | | | | | | | | |
| PARK | | | | | 0.07 | 0.15 | 0.91 | 1.19 | 0.24 | 0.58 | 0.90 | 1.16 | 0.91 | 1.19 |
| LAKE | | | | | 0.06 | 0.42 | 0.19 | 0.82 | 0.10 | 0.71 | 0.24 | 1.00 | 0.19 | 0.82 |
| HIGHWAY | | | | | -0.01 | -0.05 | 0.23 | 0.63 | 0.12 | 0.50 | 0.27 | 0.73 | 0.23 | 0.63 |
| MAIN_ST | | | | | -0.25 | -0.33 | 0.52 | 0.61 | 0.08 | 0.10 | 0.57 | 0.67 | 0.52 | 0.60 |
| CENTRALCITY | | | | | 1.16 | 1.38 | 0.95 | 0.94 | 0.94 | 1.00 | 0.82 | 0.79 | 0.95 | 0.93 |
| MA | | | | | 3.27 | 2.86*** | 3.23 | 2.29** | 2.94 | 2.25** | 3.15 | 2.22** | 3.23 | 2.30** |
| CA | | | | | -34.18 | 0.00 | -44.99 | . | -36.44 | 0.00 | -33.45 | 0.00 | -44.95 | . |
| NY | | | | | 1.43 | 1.03 | 0.43 | 0.29 | 0.39 | 0.26 | 0.39 | 0.26 | 0.43 | 0.28 |
| FL | | | | | -35.83 | 0.00 | -42.35 | . | -36.00 | 0.00 | -33.75 | 0.00 | -42.35 | . |

| Independent Variables | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | | Model 6 | | Model 7 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value |
| TX | | | | | 0.66 | 0.48 | 2.07 | 1.16 | 1.22 | 0.82 | 1.98 | 1.09 | 2.07 | 1.16 |
| ***Demographic Sifts*** | | | | | | | | | | | | | | |
| POPCHANGE | -3.96 | -1.79* | -3.54 | -1.53 | -3.35 | -1.23 | -2.44 | -0.80 | -2.48 | -0.95 | -2.71 | -0.88 | -2.39 | -0.78 |
| INCOMECHANGE | -1.26 | -0.77 | -0.99 | -0.56 | -1.87 | -0.92 | -2.96 | -1.17 | -3.34 | -1.49 | -3.08 | -1.21 | -2.94 | -1.17 |
| OWNERCHANGE | 9.84 | 1.24 | 8.26 | 0.93 | 9.42 | 0.95 | 12.82 | 1.05 | 11.04 | 1.02 | 10.57 | 0.87 | 12.87 | 1.05 |
| EDUCHANGE | -4.52 | -1.94* | -3.83 | -1.30 | -2.81 | -0.89 | -1.48 | -0.39 | -1.75 | -0.49 | -1.22 | -0.32 | -1.48 | -0.39 |
| ***Commercial Market Condition*** | | | | | | | | | | | | | | |
| RETAIL | | | -1.55 | -0.84 | -1.81 | -0.95 | -1.34 | -0.52 | -0.75 | -0.34 | -0.97 | -0.37 | -1.29 | -0.50 |
| OFFICE | | | 3.12 | 0.33 | 2.04 | 0.19 | -4.16 | -0.38 | 0.62 | 0.06 | -1.88 | -0.17 | -4.19 | -0.38 |
| ***Macro Economic*** | | | | | | | | | | | | | | |
| UNEMPLOYMENT | -42.26 | -1.16 | -56.85 | -1.38 | -68.52 | -1.38 | -64.93 | -1.24 | -52.58 | -1.02 | -103.51 | -1.50 | -64.77 | -1.23 |
| TBILL | -55.69 | -2.13** | -67.23 | -2.38** | -88.09 | -2.73*** | -111.01 | -2.92*** | -91.30 | -2.63*** | -128.27 | -2.97*** | -111.02 | -2.92*** |
| ***Sellers' Denomination*** | | | | | | | | | | | | | | |
| HIFAITH | | | 1.49 | 2.00** | 0.90 | 1.08 | 1.60 | 1.56 | 0.69 | 0.73 | 1.57 | 1.51 | 1.60 | 1.56 |
| ***Historic Designation*** | | | | | | | | | | | | | | |
| HISLNDMARK | | | -32.10 | 0.00 | -32.65 | 0.00 | -41.02 | 0.00 | -37.49 | 0.00 | -36.34 | 0.00 | -33.77 | 0.00 |
| HISDISTRICT | | | -12.29 | 0.00 | -15.37 | 0.00 | -25.92 | . | -17.74 | 0.00 | -17.13 | 0.00 | -25.90 | . |
| ***Tax Credits*** | | | | | | | | | | | | | | |
| HPTC | 25.82 | 21.52*** | 27.27 | 21.03*** | 28.29 | 18.42*** | 27.48 | 13.45*** | 27.36 | 14.68*** | 28.53 | 13.72*** | 0.95 | 2.30** |
| LIHTC | 40.49 | 36.56*** | 36.25 | 32.65*** | 38.18 | 39.52*** | 66.15 | 40.23*** | 47.41 | | 66.70 | 39.456*** | 1.91 | 3.51*** |
| NMTC | 24.21 | . | 24.58 | . | 26.43 | . | 24.63 | . | 24.40 | . | 23.29 | . | 0.91 | |
| Log Likelihood | -580.78 | | -543.40 | | -456.56 | | -388.02 | | -404.50 | | -370.84 | | -388.00 | |
| Pseudo R Squared | 0.15 | | 0.20 | | 0.33 | | 0.43 | | 0.40 | | 0.44 | | 0.43 | |

Note:

1. *, ** and *** denotes statistical significance at the 90%, 95% and 99% level of confidence, respectively.
2. Observations of Model 1 to Model 5 are 341. Theses models include all observations in the sample
3. Observations of Model 6 are 289. Model 6 only includes religious buildings which were redeveloped after 1990.
4. Tax credit variables – HPTC LIHTC NMTC – in Model 1 to Model are dummy variables indicating uses of tax credits, but in Model 7 they are the actual dollar amounts that were put for the project.

## APPENDIX FF

## THE MULTINOMIAL LOGIT REGRESSION RESULTS 5, "CHURCH TO CHURCH" AND "SCHOOL"

| Independent Variables | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | | Model 6 | | Model 7 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value |
| ***Building Characteristics*** | | | | | | | | | | | | | | |
| LNBLDFTPRINT | | | | | | | -1.37 | -1.92* | | | -1.46 | -2.02* | −1.37 | −1.92* |
| LNBLDSIZE | | | | | | | | | -0.05 | -0.15 | | | | |
| LNLOTSIZE | | | | | | | 1.59 | 2.12** | | | 1.69 | 2.21* | 1.59 | 2.12** |
| FAR | | | | | | | 6.82 | 2.39** | 1.54 | 1.08 | 7.55 | 2.58** | 6.82 | 2.40** |
| STORY | | | | | | | 0.18 | 0.44 | 0.36 | 0.85 | 0.07 | 0.18 | 0.18 | 0.44 |
| AGE | | | | | | | -0.01 | -0.80 | -0.01 | -1.00 | -0.01 | -0.84 | −0.01 | −0.80 |
| STEEPLE | | | | | | | | | -0.26 | -0.38 | | | | |
| BLUFF_STONE | | | | | | | -0.09 | -0.08 | | | 0.20 | 0.17 | −0.09 | −0.08 |
| RED_BRICK | | | | | | | 0.54 | 0.75 | | | 0.56 | 0.77 | 0.54 | 0.75 |
| ***Location Characteristics*** | | | | | | | | | | | | | | |
| PARK | | | | | -2.25 | -2.67** | -2.28 | -2.66*** | -2.32 | -2.66*** | -2.38 | -2.71*** | −2.28 | −2.66*** |
| LAKE | | | | | 0.04 | 0.53 | 0.02 | 0.19 | 0.04 | 0.41 | 0.02 | 0.21 | 0.02 | 0.19 |
| HIGHWAY | | | | | 0.10 | 0.62 | 0.10 | 0.46 | 0.07 | 0.35 | 0.10 | 0.47 | 0.10 | 0.46 |
| MAIN_ST | | | | | -0.73 | -1.29 | -0.64 | -1.01 | -0.73 | -1.20 | -0.55 | -0.87 | −0.64 | −1.01 |
| CENTRALCITY | | | | | 0.63 | 1.11 | 0.72 | 1.08 | 0.63 | 1.01 | 0.71 | 1.05 | 0.72 | 1.08 |
| MA | | | | | -35.40 | 0.00 | -45.26 | . | -36.33 | 0.00 | -36.67 | 0.00 | −45.26 | . |
| CA | | | | | -0.59 | -0.77 | -0.06 | -0.06 | -0.68 | -0.85 | -0.13 | -0.14 | −0.06 | −0.07 |
| NY | | | | | 0.89 | 0.92 | 0.36 | 0.34 | 0.34 | 0.33 | 0.33 | 0.31 | 0.36 | 0.34 |
| FL | | | | | -36.60 | 0.00 | -45.21 | . | -37.15 | 0.00 | -36.35 | 0.00 | −45.21 | . |
| TX | | | | | 0.37 | 0.34 | 0.25 | 0.21 | 0.28 | 0.25 | 0.12 | 0.10 | 0.25 | 0.21 |

| Independent Variables | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | | Model 6 | | Model 7 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value |
| ***Demographic Sifts*** | | | | | | | | | | | | | | |
| POPCHANGE | -2.82 | -1.93* | -2.76 | -1.82* | -2.35 | -1.51 | -3.14 | -1.59 | -2.95 | -1.59 | -3.29 | -1.66* | −3.15 | −1.59 |
| INCOMECHANGE | -0.57 | -0.45 | -0.36 | -0.27 | -0.90 | -0.59 | -1.61 | -0.92 | -1.52 | -0.89 | -1.76 | -0.99 | −1.62 | −0.92 |
| OWNERCHANGE | 13.74 | 2.27** | 14.86 | 2.27** | 16.20 | 2.25** | 20.48 | 2.48** | 19.45 | 2.39** | 19.70 | 2.36** | 20.49 | 2.48** |
| EDUCHANGE | -6.53 | -3.26*** | -7.28 | -3.37*** | -8.81 | -3.44*** | -9.17 | -3.20** | -8.04 | -3.05 | -9.10 | -3.11*** | −9.17 | −3.20*** |
| ***Commercial Market Condition*** | | | | | | | | | | | | | | |
| RETAIL | | | -1.16 | -0.90 | -1.74 | -1.17 | -1.66 | -0.99 | -1.58 | | | | −1.66 | −0.99 |
| OFFICE | | | -9.73 | -1.92 | -5.14 | -0.92 | -5.56 | -0.89 | -4.47 | | | | −5.56 | −0.89 |
| ***Macro Economic*** | | | | | | | | | | | | | | |
| UNEMPLOYMENT | -38.32 | -1.12 | -50.84 | -1.31 | -67.17 | -1.47 | -105.46 | -2.15** | -73.68 | -1.61 | -171.32 | -2.42** | −105.48 | −2.15** |
| TBILL | -37.28 | -1.66* | -46.47 | -1.93* | -62.92 | -2.30** | -72.96 | -2.48** | -62.62 | -2.25** | -102.35 | -2.84*** | −72.99 | −2.48** |
| ***Sellers' Denomination*** | | | | | | | | | | | | | | |
| HIFAITH | | | 0.94 | 1.41 | 0.88 | 1.18 | 1.32 | 1.62 | 1.12 | 1.39 | 1.32 | 1.60 | 1.32 | 1.62 |
| ***Historic Designation*** | | | | | | | | | | | | | | |
| HISLNDMARK | | | -34.08 | 0.00 | -35.93 | 0.00 | -43.36 | . | -36.25 | 0.00 | 1.32 | 1.60 | −43.36 | . |
| HISDISTRICT | | | -12.40 | 0.00 | -15.11 | 0.00 | -23.07 | . | -16.14 | 0.00 | -38.80 | 0.00 | −23.06 | . |
| ***Tax Credits*** | | | | | | | | | | | | | | |
| HPTC | 23.60 | . | 24.90 | . | 24.78 | . | 22.77 | . | 23.40 | . | 23.74 | . | 0.78 | 0.96 |
| LIHTC | -4.37 | 0.00 | -12.43 | . | -10.30 | . | -2.98 | . | 0.80 | . | -2.18 | . | −0.30 | . |
| NMTC | -12.98 | 0.00 | -14.90 | 0.00 | -17.96 | . | -19.52 | . | -21.13 | . | -20.91 | . | −0.23 | . |
| Log Likelihood | -580.78 | | -543.40 | | -456.56 | | -388.02 | | -404.50 | | -370.84 | | -388.00 | |
| Pseudo R Squared | 0.15 | | 0.20 | | 0.33 | | 0.43 | | 0.40 | | 0.44 | | 0.43 | |

Note:

1. *, ** and *** denotes statistical significance at the 90%, 95% and 99% level of confidence, respectively.
2. Observations of Model 1 to Model 5 are 341. Theses models include all observations in the sample
3. Observations of Model 6 are 289. Model 6 only includes religious buildings which were redeveloped after 1990.
4. Tax credit variables – HPTC LIHTC NMTC – in Model 1 to Model are dummy variables indicating uses of tax credits, but in Model 7 they are the actual dollar amounts that were put for the project.

## APPENDIX GG:

## THE MULTINOMIAL LOGIT REGRESSION RESULTS 6, "CHURCH TO CHURCH" AND "CULTURAL"

| Independent Variables | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | | Model 6 | | Model 7 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value |
| ***Building Characteristics*** | | | | | | | | | | | | | | |
| LNBLDFTPRINT | | | | | | | -0.22 | -0.36 | | | -0.30 | -0.50 | -0.22 | -0.36 |
| LNBLDSIZE | | | | | | | | | -0.19 | -0.66 | | | | |
| LNLOTSIZE | | | | | | | 0.03 | 0.05 | | | 0.03 | 0.05 | 0.03 | 0.05 |
| FAR | | | | | | | 1.65 | 0.80 | 1.93 | 1.70* | 2.01 | 0.93 | 1.66 | 0.80 |
| STORY | | | | | | | 0.13 | 0.41 | 0.21 | 0.60 | -0.01 | -0.02 | 0.13 | 0.41 |
| AGE | | | | | | | 0.02 | 2.09** | 0.02 | 2.02** | 0.02 | 1.99** | 0.02 | 2.09** |
| STEEPLE | | | | | | | | | -0.14 | -0.23 | | | | |
| BLUFF_STONE | | | | | | | 0.54 | 0.64 | | | 0.52 | 0.56 | 0.54 | 0.64 |
| RED_BRICK | | | | | | | -0.61 | -1.02 | | | -0.59 | -0.97 | -0.61 | -1.02 |
| ***Location Characteristics*** | | | | | | | | | | | | | | |
| PARK | | | | | -0.59 | -1.38 | -0.51 | -1.12 | -0.42 | -0.94 | -0.40 | -0.90 | -0.52 | -1.12 |
| LAKE | | | | | 0.01 | 0.15 | 0.01 | 0.12 | 0.02 | 0.21 | 0.01 | 0.08 | 0.01 | 0.12 |
| HIGHWAY | | | | | 0.07 | 0.56 | 0.19 | 1.48 | 0.16 | 1.25 | 0.19 | 1.51 | 0.19 | 1.48 |
| MAIN_ST | | | | | -0.59 | -1.25 | -0.33 | -0.65 | -0.45 | -0.89 | -0.35 | -0.66 | -0.33 | -0.65 |
| CENTRALCITY | | | | | 1.35 | 2.64*** | 1.08 | 1.88* | 1.14 | 2.06** | 0.95 | 1.64* | 1.08 | 1.88* |
| MA | | | | | 1.97 | 2.09** | 1.20 | 1.11 | 1.26 | 1.19 | 1.07 | 0.96 | 1.20 | 1.11 |
| CA | | | | | -2.64 | -2.30** | -2.60 | -2.22** | -2.58 | -2.20** | -2.67 | -2.26** | -2.60 | -2.22** |
| NY | | | | | 0.98 | 1.07 | 0.47 | 0.48 | 0.54 | 0.56 | 0.60 | 0.59 | 0.47 | 0.48 |
| FL | | | | | -1.60 | -1.63 | -1.26 | -1.13 | -1.22 | -1.14 | -1.19 | -1.07 | -1.26 | -1.13 |
| TX | | | | | -0.36 | -0.40 | 0.37 | 0.39 | 0.10 | 0.11 | 0.38 | 0.39 | 0.37 | 0.39 |

| Independent Variables | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | | Model 6 | | Model 7 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value |
| ***Demographic Sifts*** | | | | | | | | | | | | | | |
| POPCHANGE | -2.29 | -1.80* | -3.01 | -2.08** | -2.38 | -1.58 | -1.42 | -0.94 | -1.81 | -1.10 | -1.75 | -1.16 | -1.42 | -0.94 |
| INCOMECHANGE | 1.10 | 1.19 | 0.83 | 0.82 | -0.01 | -0.01 | -0.87 | -0.70 | -0.52 | -0.43 | -0.74 | -0.58 | -0.87 | -0.70 |
| OWNERCHANGE | 10.40 | 1.96** | 13.43 | 2.33** | 14.71 | 2.31** | 18.00 | 2.51** | 16.91 | 2.38** | 16.78 | 2.38** | 18.00 | 2.51** |
| EDUCHANGE | -1.89 | -1.36 | -2.29 | -1.57 | -1.81 | -1.14 | -1.92 | -1.09 | -1.72 | -1.01 | -2.93 | -1.49 | -1.92 | -1.09 |
| ***Commercial Market Condition*** | | | | | | | | | | | | | | |
| RETAIL | | | -0.07 | -0.17 | -0.05 | -0.30 | -0.06 | -0.32 | -0.07 | -0.32 | -0.06 | -0.36 | -0.06 | -0.32 |
| OFFICE | | | 8.88 | 1.71* | 9.15 | 1.60 | 10.58 | 1.68* | 9.66 | 1.54 | 11.88 | 1.86* | 10.59 | 1.68* |
| ***Macro Economic*** | | | | | | | | | | | | | | |
| UNEMPLOYMENT | -55.69 | -2.05** | -54.13 | -1.99** | -72.19 | -2.24** | -79.68 | -2.33** | -77.05 | -2.30* | -111.29 | -2.10** | -79.69 | -2.33** |
| TBILL | -47.58 | -2.64*** | -53.62 | -2.84*** | -72.80 | -3.29*** | -76.55 | -3.15*** | -70.55 | -2.98*** | -90.61 | -2.98*** | -76.55 | -3.15*** |
| ***Sellers' Denomination*** | | | | | | | | | | | | | | |
| HIFAITH | | | 0.10 | 0.15 | -0.55 | -0.79 | -0.81 | -1.08 | -0.74 | -1.00 | -0.77 | -1.01 | -0.81 | -1.08 |
| ***Historic Designation*** | | | | | | | | | | | | | | |
| HISLNDMARK | | | 4.04 | 3.08*** | 4.11 | 3.02*** | 2.91 | 1.99** | 2.95 | 2.03** | 2.34 | 1.66* | 2.91 | 1.99* |
| HISDISTRICT | | | 25.06 | 17.25*** | 23.32 | 15.63*** | 22.86 | 13.87*** | 22.28 | 13.87*** | 23.18 | 14.02*** | 22.87 | 13.89*** |
| ***Tax Credits*** | | | | | | | | | | | | | | |
| HPTC | -9.89 | 0.00 | -13.55 | 0.00 | -15.08 | 0.00 | -23.36 | . | -15.69 | 0.00 | -14.61 | 0.00 | -0.10 | -0.32 |
| LIHTC | -3.42 | 0.00 | -10.80 | . | 1.53 | 0.00 | -5.74 | . | -0.56 | . | -5.90 | . | -0.01 | . |
| NMTC | -12.02 | 0.00 | -14.79 | 0.00 | -19.44 | . | -19.81 | . | -16.52 | 0.00 | -20.68 | . | 0.08 | . |
| Log Likelihood | -580.78 | | -543.40 | | -456.56 | | -388.02 | | -404.50 | | -370.84 | | -388.00 | |
| Pseudo R Squared | 0.15 | | 0.20 | | 0.33 | | 0.43 | | 0.40 | | 0.44 | | 0.43 | |

Note:

1. *, ** and *** denotes statistical significance at the 90%, 95% and 99% level of confidence, respectively.
2. Observations of Model 1 to Model 5 are 341. Theses models include all observations in the sample
3. Observations of Model 6 are 289. Model 6 only includes religious buildings which were redeveloped after 1990.
4. Tax credit variables – HPTC LIHTC NMTC – in Model 1 to Model are dummy variables indicating uses of tax credits, but in Model 7 they are the actual dollar amounts that were put for the project.

## APPENDIX HH

## THE MULTINOMIAL LOGIT REGRESSION RESULTS 7, "CHURCH TO CHURCH" AND "UNDEVELOPED"

| Independent Variables | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | | Model 6 | | Model 7 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value |
| ***Building Characteristics*** | | | | | | | | | | | | | | |
| LNBLDFTPRINT | | | | | | | 1.44 | 2.45** | | | 1.35 | 2.35** | 1.44 | 2.45** |
| LNBLDSIZE | | | | | | | | | 0.08 | 0.30 | | | | |
| LNLOTSIZE | | | | | | | -1.46 | -2.64*** | | | -1.42 | -2.66*** | -1.46 | -2.64*** |
| FAR | | | | | | | 0.15 | 0.08 | 3.67 | 3.20*** | -0.80 | -0.43 | 0.15 | 0.08 |
| STORY | | | | | | | -0.38 | -0.98 | -0.40 | -1.00 | 0.50 | 1.27 | -0.38 | -0.98 |
| AGE | | | | | | | -0.02 | -1.55 | -0.01 | -1.04 | 0.02 | 1.65* | -0.02 | -1.55 |
| STEEPLE | | | | | | | | | 0.87 | 1.48 | | | | |
| BLUFF_STONE | | | | | | | 0.46 | 0.49 | | | 0.93 | 0.92 | 0.46 | 0.49 |
| RED_BRICK | | | | | | | -0.05 | -0.09 | | | -0.01 | -0.02 | -0.05 | -0.09 |
| ***Location Characteristics*** | | | | | | | | | | | | | | |
| PARK | | | | | -0.01 | -0.04 | 0.11 | 0.47 | 0.17 | 0.79 | 0.08 | 0.37 | 0.11 | 0.47 |
| LAKE | | | | | 0.02 | 0.34 | 0.09 | 1.23 | 0.07 | 0.96 | 0.10 | 1.29 | 0.09 | 1.23 |
| HIGHWAY | | | | | 0.12 | 1.21 | 0.20 | 1.69* | 0.17 | 1.49 | 0.19 | 1.62* | 0.20 | 1.69* |
| MAIN_ST | | | | | -0.59 | -1.30 | -0.32 | -0.61 | -0.44 | -0.88 | -0.16 | -0.31 | -0.32 | -0.61 |
| CENTRALCITY | | | | | 0.79 | 1.70* | 0.71 | 1.30 | 0.56 | 1.09 | 0.74 | 1.34 | 0.71 | 1.30 |
| MA | | | | | 0.59 | 0.54 | 0.31 | 0.25 | 0.37 | 0.31 | 0.24 | 0.19 | 0.31 | 0.25 |
| CA | | | | | -38.44 | 0.00 | -48.77 | . | -39.29 | 0.00 | -39.09 | 0.00 | -48.77 | . |
| NY | | | | | -0.25 | -0.24 | -0.91 | -0.77 | -1.05 | -0.91 | -1.12 | -0.94 | -0.91 | -0.77 |
| FL | | | | | -1.85 | -1.99** | -2.23 | -1.95* | -2.05 | -1.91* | -2.31 | -2.01** | -2.23 | -1.95* |
| TX | | | | | 0.28 | 0.38 | 0.43 | 0.53 | 0.33 | 0.42 | 0.33 | 0.39 | 0.43 | 0.53 |

| Independent Variables | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | | Model 6 | | Model 7 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value | Coef. | z-value |
| ***Demographic Sifts*** | | | | | | | | | | | | | | |
| POPCHANGE | -0.63 | -0.61 | -0.67 | -0.63 | -0.77 | -0.62 | -0.10 | -0.07 | -0.32 | -0.23 | -0.26 | -0.18 | -0.10 | -0.07 |
| INCOMECHANGE | -0.13 | -0.12 | -0.14 | -0.13 | -1.34 | -0.99 | -1.74 | -1.15 | -1.61 | -1.10 | -1.91 | -1.30 | -1.73 | -1.15 |
| OWNERCHANGE | 4.39 | 0.86 | 4.94 | 0.93 | 6.80 | 1.04 | 7.67 | 0.97 | 6.04 | 0.84 | 7.13 | 0.91 | 7.67 | 0.97 |
| EDUCHANGE | -1.66 | -1.18 | -1.79 | -1.22 | -2.03 | -1.28 | -1.36 | -0.81 | -1.69 | -1.03 | -0.75 | -0.41 | -1.37 | -0.81 |
| ***Commercial Market Condition*** | | | | | | | | | | | | | | |
| RETAIL | | | -0.02 | -0.38 | -0.03 | -0.40 | -0.04 | -0.65 | -0.05 | -0.71 | -0.05 | -0.71 | -0.04 | -0.65 |
| OFFICE | | | -4.89 | -1.03 | -1.69 | -0.30 | -0.01 | 0.00 | -0.81 | -0.13 | 2.22 | 0.33 | -0.01 | 0.00 |
| ***Macro Economic*** | | | | | | | | | | | | | | |
| UNEMPLOYMENT | -4.97 | -0.21 | -8.82 | -0.36 | -6.54 | -0.20 | -13.90 | -0.41 | -3.17 | -0.10 | -38.53 | -1.04 | -13.90 | -0.41 |
| TBILL | -67.47 | -3.52*** | -67.75 | -3.35*** | -85.45 | -3.33*** | -105.81 | -3.73*** | -95.67 | -3.51*** | -119.99 | -3.78*** | -105.81 | -3.73*** |
| ***Sellers' Denomination*** | | | | | | | | | | | | | | |
| HIFAITH | | | -0.64 | -0.78 | -1.02 | -1.17 | -0.82 | -0.85 | -1.05 | -1.13 | -0.94 | -0.95 | -0.82 | -0.85 |
| ***Historic Designation*** | | | | | | | | | | | | | | |
| HISLNDMARK | | | -32.61 | 0.00 | -34.23 | 0.00 | -42.62 | . | -34.99 | 0.00 | -36.03 | 0.00 | -42.61 | . |
| HISDISTRICT | | | -10.49 | 0.00 | -13.45 | 0.00 | -20.90 | . | -14.30 | 0.00 | -12.88 | 0.00 | -20.90 | . |
| ***Tax Credits*** | | | | | | | | | | | | | | |
| HPTC | -9.77 | 0.00 | -10.63 | 0.00 | -11.96 | 0.00 | -20.06 | . | -13.61 | 0.00 | -0.94 | -0.95 | 0.03 | 0.09 |
| LIHTC | -3.26 | 0.00 | -10.76 | . | -11.19 | . | -6.51 | . | -1.19 | . | -36.03 | 0.00 | -0.02 | . |
| NMTC | -12.29 | 0.00 | -13.54 | 0.00 | -18.30 | . | -20.29 | . | -19.74 | 0.00 | -12.88 | 0.00 | -0.16 | . |
| Log Likelihood | -580.78 | | -543.40 | | -456.56 | | -388.02 | | -404.50 | | -370.84 | | -388.00 | |
| Pseudo R Squared | 0.15 | | 0.20 | | 0.33 | | 0.43 | | 0.40 | | 0.44 | | 0.43 | |

Note:

1. *, ** and *** denotes statistical significance at the 90%, 95% and 99% level of confidence, respectively.
2. Observations of Model 1 to Model 5 are 341. Theses models include all observations in the sample
3. Observations of Model 6 are 289. Model 6 only includes religious buildings which were redeveloped after 1990.
4. Tax credit variables – HPTC LIHTC NMTC – in Model 1 to Model are dummy variables indicating uses of tax credits, but in Model 7 they are the actual dollar amounts that were put for the project.

## APPENDIX II

## LOG LIKELIHOOD RATIO TEST OF MODEL 4

| Effect | Model Fitting Criteria | Likelihood Ratio Tests | | |
|---|---|---|---|---|
| | -2 Log Likelihood of Reduced Model | Chi-Square | df | Sig. |
| LNBLDFTPRINT | 752.38 | 22.17 | 7.00 | .00 |
| LNLOTSIZE | 756.23 | 26.02 | 7.00 | .00 |
| FAR | 748.97 | 18.76 | 7.00 | .01 |
| STORY | 743.67 | 13.47 | 7.00 | .06 |
| AGE | 749.14 | 18.94 | 7.00 | .01 |
| PARK | 768.30 | 23.56 | 7.00 | .00 |
| LAKE | 740.01 | 9.81 | 7.00 | .20 |
| HIGHWAY | 744.90 | 14.69 | 7.00 | .04 |
| POPCHANGE | 737.85 | 7.65 | 7.00 | .36 |
| INCOMECHANGE | 739.08 | 8.87 | 7.00 | .26 |
| OWNERCHANGE | 748.88 | 18.67 | 7.00 | .01 |
| EDUCHANGE | 749.98 | 19.78 | 7.00 | .01 |
| RETAIL | 744.27 | 14.07 | 7.00 | .05 |
| OFFICE | 735.67 | 5.47 | 7.00 | .60 |
| UNEMPLOYMENT | 746.08 | 15.87 | 7.00 | .03 |
| TBILL | 755.43 | 25.23 | 7.00 | .00 |
| BLUFF_STONE | 747.04 | 16.84 | 14.00 | .26 |
| RED_BRICK | 750.88 | 20.67 | 14.00 | .11 |
| MAIN_ST | 752.31 | 22.11 | 14.00 | .08 |
| CENTRALCITY | 757.15 | 26.94 | 14.00 | .02 |
| MA | 770.68 | 40.48 | 14.00 | .00 |
| CA | 776.92 | 46.71 | 14.00 | .00 |
| NY | 743.55 | 13.34 | 14.00 | .50 |
| FL | 753.24 | 23.03 | 14.00 | .06 |
| TX | 743.79 | 13.59 | 14.00 | .48 |
| HIFAITH | 757.64 | 27.44 | 14.00 | .02 |
| HISLNDMARK | 737.71 | 7.51 | 7.00 | .38 |
| HISDISTRICT | 739.56 | 9.36 | 7.00 | .23 |
| HPTC | 734.91 | 4.70 | 7.00 | .70 |
| LIHTC | 749.46 | 19.26 | 7.00 | .01 |
| NMTC | 742.79 | 12.59 | 7.00 | .08 |

## APPENDIX JJ

Multinomial Logit Regression Results, Reference Category: Retail

| Variables | Undeveloped | | church to church | | Cultural | | School | | Low Income Housing | | Office | | Condo | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | Z-value | Coef. | Z-value | Coef. | Z-value | Coef. | Z-value | Coef. | Z-value | Coef. | Z-value | Coef. | Z-value |
| ***Building Characteristics*** | | | | | | | | | | | | | | |
| LNBLDFTPRINT | -0.35 | -0.16 | -2.38 | -1.17 | -2.03 | -0.95 | -0.52 | -0.20 | -4.03 | -1.07 | -3.42 | -1.55 | 1.75 | 0.91 |
| LNBLDSIZE | 3.44 | 1.56 | 3.90 | 1.97* (49.52) | 3.39 | 1.61 | 0.65 | 0.25 | 4.60 | 1.25 | 3.39 | 1.49 | 0.72 | 0.40 |
| LNLOTSIZE | -1.64 | -2.40** (0.19) | -0.05 | -0.09 | -0.07 | -0.11 | 1.60 | 1.93** (4.95) | 0.08 | 0.07 | -0.35 | -0.56 | -1.43 | -2.24** (0.24) |
| FAR | -4.70 | -2.16** (0.01) | -4.45 | -2.16** (0.01) | -2.99 | -1.33 | 2.84 | 0.92 | -0.39 | -0.10 | -4.17 | -1.75* (0.02) | -6.27 | -2.95*** (0.00) |
| STORY | -1.36 | -1.08 | -1.24 | -1.08 | -0.63 | -0.58 | 0.66 | 0.50 | -0.91 | -0.51 | -1.20 | -0.97 | 0.57 | 0.61 |
| AGE | -0.01 | -1.07 | 0.01 | 0.51 | 0.03 | 2.20** (1.03) | -0.01 | -0.43 | -0.02 | -0.77 | 0.00 | -0.02 | 0.02 | 2.17** (1.02) |
| STEEPLE | -0.48 | -0.65 | -1.37 | -2.10** (0.25) | -1.96 | -2.59*** (0.14) | -1.54 | -1.82* (0.22) | 0.57 | 0.54 | -1.22 | -1.51 | -1.59 | -2.27** (0.20) |
| BLUFF_STONE | 1.53 | 1.33 | 1.52 | 1.37 | 2.38 | 2.15** (10.77) | 1.48 | 1.10 | 27.97 | . | 0.39 | 0.31 | 2.28 | 2.05** (9.82) |
| RED_BRICK | -0.24 | -0.35 | -0.02 | -0.03 | -0.51 | -0.74 | 0.52 | 0.63 | 27.87 | 20.98*** (19.66) | -0.10 | -0.14 | 0.48 | 0.70 |
| ***Location Characteristics*** | | | | | | | | | | | | | | |
| PARK | -0.27 | -1.12 | -0.37 | -1.49 | -0.90 | -1.82* (0.41) | -2.67 | -3.10*** (0.07) | 0.28 | 0.34 | 0.29 | 1.64* (1.34) | -0.70 | -2.26** (0.50) |
| LAKE | 0.13 | 1.10 | 0.03 | 0.22 | 0.04 | 0.28 | 0.03 | 0.22 | 0.31 | 1.18 | -0.26 | -1.41 | 0.10 | 0.80 |
| HIGHWAY | 0.24 | 1.61 | 0.04 | 0.24 | 0.22 | 1.34 | 0.10 | 0.44 | 0.39 | 0.93 | -0.06 | -0.27 | 0.35 | 2.44** (1.41) |
| MAIN_ST | -1.25 | -1.95* (0.29) | -0.93 | -1.63* (0.40) | -1.27 | -2.06** (0.28) | -1.54 | -2.07** (0.22) | -0.48 | -0.52 | -0.52 | -0.75 | -1.42 | -2.37** (0.24) |

| Variables | Undeveloped | | church to church | | Cultural | | School | | Low Income Housing | | Office | | Condo | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | Z-value | Coef. | Z-value | Coef. | Z-value | Coef. | Z-value | Coef. | Z-value | Coef. | Z-value | Coef. | Z-value |
| CENTRALCITY | -0.56 | -0.81 | -1.28 | -2.11** (0.28) | -0.20 | -0.29 | -0.50 | -0.63 | -0.20 | -0.18 | 0.58 | 0.73 | -0.19 | -0.27 |
| MA | -0.18 | -0.15 | -0.59 | -0.49 | 0.53 | 0.51 | -41.48 | 0.00 | 2.88 | 2.01** (17.87) | 1.71 | 1.57 | 1.93 | 1.96* (6.88) |
| CA | -41.04 | 0.00 | 2.52 | 2.35** (12.39) | 0.06 | 0.04 | 2.47 | 1.92* (11.88) | -37.55 | 0.00 | 1.66 | 1.20 | 2.01 | 1.71 |
| NY | -1.13 | -0.92 | -0.20 | -0.20 | 0.49 | 0.47 | 0.29 | 0.26 | -0.08 | -0.05 | 0.37 | 0.32 | 1.56 | 1.60 |
| FL | -1.13 | -0.88 | 1.09 | 1.21 | -0.17 | -0.14 | -39.72 | 0.00 | -37.04 | 0.00 | -2.05 | -1.06 | -39.13 | 0.00 |
| TX | 1.59 | 1.34 | 1.40 | 1.16 | 1.63 | 1.26 | 1.57 | 1.07 | 3.19 | 1.61 | -39.03 | 0.00 | 1.53 | 1.12 |
| ***Demographic Sifts*** | | | | | | | | | | | | | | |
| POPCHANGE | 0.25 | 0.13 | 0.26 | 0.15 | -1.36 | -0.70 | -2.93 | -1.22 | -1.81 | -0.55 | -3.00 | -1.32 | 0.36 | 0.19 |
| INCOMECHANGE | -0.34 | -0.22 | 1.53 | 1.08 | 0.70 | 0.51 | 0.00 | 0.00 | -2.27 | -0.83 | 3.43 | 2.36** (30.88) | 1.63 | 1.16 |
| OWNERCHANGE | -10.45 | -1.21 | -18.46 | -2.51*** (0.00) | 0.08 | 0.01 | 1.47 | 0.17 | -3.87 | -0.28 | -18.28 | -2.13** (0.00) | -13.12 | -1.71* (0.00) |
| EDUCHANGE | 0.62 | 0.30 | 1.79 | 0.93 | -0.45 | -0.21 | -7.21 | -2.31** (0.00) | 0.50 | 0.13 | 1.74 | 0.79 | 1.39 | 0.69 |
| ***Local commercial market Condition*** | | | | | | | | | | | | | | |
| RETAIL | 0.49 | 0.36 | 0.53 | 0.39 | 0.46 | 0.34 | -1.19 | -0.59 | 0.39 | 0.13 | -0.56 | -0.32 | -0.01 | -0.01 |
| OFFICE | -14.00 | -1.78* (0.00) | -14.23 | -2.02** (0.00) | -3.58 | -0.59 | -19.07 | -2.42** (0.00) | -14.43 | -1.18 | -7.80 | -0.88 | -10.10 | -1.57 |
| ***Macro Economic*** | | | | | | | | | | | | | | |
| UNEMPLOYMENT | 33.60 | 0.78 | 41.99 | 1.05 | -40.25 | -0.95 | -71.60 | -1.25 | -6.46 | -0.10 | -36.56 | -0.65 | -70.34 | -1.56 |
| TBILL | -33.29 | -1.02 | 71.73 | 2.39** (0.00) | -2.79 | -0.10 | -4.30 | -0.13 | -28.15 | -0.69 | 32.08 | 0.99 | 35.90 | 1.26 |
| ***Sellers' Denomination*** | | | | | | | | | | | | | | |
| HIFAITH | -0.46 | -0.40 | 0.55 | 0.66 | -0.38 | -0.40 | 1.86 | 1.84* (6.43) | 1.74 | 1.50 | 1.64 | 1.83** (5.14) | 1.11 | 1.34 |
| ***Historic Designation*** | | | | | | | | | | | | | | |

| Variables | Undeveloped | | church to church | | Cultural | | School | | Low Income Housing | | Office | | Condo | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coef. | Z-value | Coef. | Z-value | Coef. | Z-value | Coef. | Z-value | Coef. | Z-value | Coef. | Z-value | Coef. | Z-value |
| HISLNDMARK | -40.63 | 0.00 | -1.47 | -0.73 | 1.41 | 0.86 | -42.84 | 0.00 | -35.27 | 0.00 | 0.56 | 0.30 | -0.57 | -0.34 |
| HISDISTRICT | -40.61 | 0.00 | -40.52 | 0.00 | -0.31 | -0.20 | -42.92 | 0.00 | -45.41 | 0.00 | 0.53 | 0.31 | -0.88 | -0.53 |
| ***Tax Credits*** | | | | | | | | | | | | | | |
| HPTC | -0.67 | 0.00 | -0.72 | 0.00 | -0.81 | 0.00 | -0.08 | -1.07 | 0.09 | 1.30 | -0.03 | -0.50 | -0.83 | 0.00 |
| LIHTC | 0.26 | . | 0.36 | . | 0.40 | . | 0.14 | . | 2.51 | 4.10*** (12.32) | 0.24 | . | 0.45 | . |
| NMTC | -0.79 | 0.00 | -0.78 | 0.00 | -0.78 | 0.00 | -0.87 | -1.05 | -0.10 | -1.18 | -0.82 | -1.79* (0.44) | -0.78 | 0.00 |

Note:
Pseudo R Squared: 0.46
N: 341