Abstract

JOLLEY, GEORGE JASON. Diffusion of Innovation of Supply-Side Economic Development Policy: Explaining the Determinants of Local Government Enterprise Zone Adoption. (Under the direction of G. David Garson.)

Despite the widespread study of diffusion of policy innovation among states, little is known the factors influencing adoption or the pattern of innovation among local governments. This study utilizes logit regression and Cox regression (also known as Cox proportional hazards modeling) to examine the predictive factors of local government enterprise zone adoption in Illinois. Utilizing counties as the unit of analysis, the demographic, economic, political, and regional diffusion factors influencing adoption of enterprise zones are examined over a 23-year period from 1981 to 2003.

Representation by a sponsor of the enterprise zone legislation and having an unemployment rate higher than the state average are the strongest predictors of enterprise zone adoption within a county's borders. Counties represented by a bill sponsor are 6.67 times more likely to adopt an enterprise zone compared to a county not represented by a bill sponsor. Likewise, each unit difference in higher unemployment rate compared to the state average means a county would be two times more likely to adopt. The findings support the importance of policy entrepreneurs, especially state legislators, in driving policy innovation in their districts. However, the enterprise zones were designated in counties with a higher than average unemployment rate suggesting those counties in economic need were more likely to receive the intended benefit. Consistent with prior studies of diffusion of innovation, the data reveal a pattern with some early adopters, many middle adopters, and fewer late

adopters. When plotted, the data resembles a logistic “S” curve and natural breaks in the data exist for early, middle, and late adopters.

The intent of this study was to develop a predictive model explaining enterprise zone adoption in Illinois. This study has limited generalizablity beyond Illinois and limited generalizability in application to mandated or non-voluntary enterprise zone adoption. However, the study provided an opportunity to test many of prior assumptions about the drivers of policy innovation at the local government level, which are rarely examined in the academic literature.

Diffusion of Innovation of Supply-Side Economic Development Policy:
Explaining the Determinants of Local Government
Enterprise Zone Adoption

by
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Dedication

This dissertation is dedicated to my wife, Heather, and daughters, Abigail, Audrey, and Alexandra.

Biography

G. Jason Jolley is native of Cleveland County, North Carolina. In 1998, he graduated from the University of North Carolina at Chapel Hill with a Bachelor of Arts degree in economics. In 2000, he completed a Master of Arts degree in political science from the University of Tennessee under the direction of Dr. Michael Fitzgerald. Mr. Jolley worked for several years as a planning and economic development practitioner in Illinois and North Carolina.

Mr. Jolley is currently the Senior Research Director for the University of North Carolina's Center for Competitive Economies (C3E) in the Frank Hawkins Kenan Institute of Private Enterprise. He is also an Adjunct Assistant Professor in the Kenan-Flagler Business School. In his role with C3E, Mr. Jolley served as a co-principal investigator on one of the largest state sponsored studies of the effectiveness of state tax credit and economic development incentive programs. Mr. Jolley has authored/coauthored research appearing in *Review of Policy Research*, *Business Strategy and the Environment,* and *the Journal of Extension.*

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I decided to enroll at North Carolina State University to work with Dr. Nicole Darnall. Nicole provided countless opportunities for me to research, write, and publish. She challenged me to write and think more critically, pushed my comfort zone with statistical analysis, and always encouraged me even when I overcommitted. Most importantly, she always treated me as a peer and equal, even when my efforts and contributions did not merit such treatment. After Nicole’s departure to George Mason University, Dr. Jim Svara served as my advisor. Dr. Svara directed an independent study in economic development where I generated the topic of this dissertation. Dr. Svara assisted me in creating the initial research framework for studying enterprise zone adoption.

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With respect to my dissertation, I am indebted to many people for sharing their time and resources to inform this work. In my first professional job with Growth Dimensions, Inc., an economic development agency in Belvidere, Illinois, I had the opportunity to assist Mr. Bill Luhman in administering the local enterprise zone. This helped to shape my understanding of the Illinois Enterprise Zone program. Mr. Raymond Collins, a reference librarian with Illinois State Library, shared his time and expertise in helping me to find the original legislation, identify bill sponsors, and their legislative districts. Mr. Ken Lovett with the Illinois Department of Revenue found and scanned copies of property tax histories for each county previously unavailable in electronic format. Mr. Dave Stewart with the Illinois Department of Revenue was instrumental in sharing sales tax data. Mr. Tom Henderson with the Illinois Enterprise Zone Association shared countless annual reports to assist me in determining the initial adoption year. My colleague at UNC, Dr. Steve Appold, provided helpful advice on research methods, including the suggestion to use separate logit models for early, middle, and late adopters in the dissertation.

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I: Introduction

The emulation and competition that shape state policy decisions have placed diffusion of innovation among the prominent theoretical frameworks within the federalism literature (Gray, 1994). Diffusion of innovation is “the process by which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 1995). Within the context of diffusion of innovation, innovation is defined in multiple ways. For the purpose of this study, diffusion is defined as something that is new to the adopting organization even if it exists in other organizations. While disagreement exists regarding what constitutes an innovation, defining innovation as something new to the organization is consistent with prior literature (Daft, 1978; Damanpour & Evan, 1984; Damanpour, 1991). Most diffusion of innovation studies in the policy literature utilize the state as the unit or level of analysis and focus on the internal characteristics of and/or the horizontal interactions among states that drive the policy innovation and adoption process (Gray, 1994; Shipan & Volden, 2005).

This introductory chapter broadly discusses the determinants of diffusion of innovation and how this study contributes to the existing literature by addressing both substantive policy area and level of analysis gaps in the current literature. The remainder of this chapter discusses the research problem and broad research questions within the context of both theory and policy. The chapter also provides an overview of supply-side economic policy and previews the remaining dissertation chapters and study methodology.

Statement of the research problem

This purpose of this study is to contribute to the existing literature on diffusion of innovation by combining two areas largely neglected in previous literature. First, despite the widespread competition among states for new jobs, industrial prospects, and tax rates, the proliferation of economic development practice and policy has been ignored largely within the diffusion literature (Gray, 1994). Second, because most studies concentrate on state policy innovations, little is known about the determinants and patterns of local level policy diffusion. Scholars have stressed the importance of specifying levels of analysis (Klein, Dansereau, & Hall, 1994) yet little is known about whether state patterns of diffusion and determinants of policy adoption remain constant at the local level (Shipan & Volden, 2005). This dissertation is unique in its combination of a neglected policy area in economic development with a neglected level of analysis in local government by exploring the determinants of within state diffusion of economic development supply-side policy adoption using counties as the unit of analysis. Supply-side policies focus on lowering input-costs through government subsidies of capital, land, and incentives (or low taxes). These approaches target mobile capital and allow the private sector to guide investment decisions (Eisinger, 1988). Enterprise zones are used as a measure of supply-side adoption.

This study is exploratory in nature. Event history analysis in the form of Cox regression will be used to explore both the internal and external determinants of enterprise zone adoptions. A discrete time event logit model will be used for comparison purposes. The analytical focus is the population of counties within the State of Illinois. Illinois has a well-established enterprise zone program with voluntary adoption and a sufficient number of counties and adopters to apply statistical techniques. While this study does not seek to generalize to a larger population of states, it does provide an excellent framework for future comparisons of Illinois' within state diffusion patterns to those of other states.

Utilizing the enterprise zone programs in Illinois, this dissertation seeks to answer three research questions:

1. Do the determinants of horizontal diffusion at the state level translate to the local government level?
2. Does local government level supply-side policy diffusion follow the traditional diffusion "S" (logistic) curve?
3. What types of counties are adopters of supply-side economic development approaches?

Contextual background

Research questions 1 and 2 demonstrate the theoretical importance of this research. The plethora of prior research using the state as the level of analysis categorizes the determinants of state policy diffusion of innovation into two broad categories: internal determinants and external actions (Gray, 1994). The internal determinants are broadly defined as the demographic, social, political, and economic characteristics that drive innovation, while the external actions capture the geographic interactions among states, external policy networks, and vertical influences from the federal government that influence policy innovation (Gray, 1994). Within the framework of external influences, previous literature has outlined three basic reasons that states emulate each other: 1) states learn as they borrow successful innovations from other states, 2) states compete with each other to gain competitive advantage, and 3) citizens pressure their own state to adopt the innovative policies of other states (Berry & Berry, 1999).

Prior studies of policy and other forms of diffusion have found that diffusion of innovation generally follows a logistic or "S" curve over time with a few leading adopters, many adopters in the middle range, and a few laggards (Rogers, 1995). While the prior studies of local level diffusion are limited, only one (Shipan & Volden, 2005) specifically tested whether local levels diffusion followed a logistic curve over time.

Research question 3 demonstrates the policy relevance of this study. Enterprise zones are state sponsored programs voluntarily adopted by local governments to attract private development to geographically designated, economically depressed areas through tax abatements and other subsidies. Enterprise zones were innovative policies in the early 1980s that have been routinized over time.[1] Currently, enterprise zones are

[1] For a discussion of routinization, see (Mayer & Davidson, 2000; Yin, 1981)

among the standard, incentive-based policy tools used by economic developers and local governments to attract industries and other private firms.

Despite the widespread use of supply-side, incentive-based approaches to economic development, including enterprise zones, little research has been done to examine what types of local governments adopt and use these policies. Acquiring information about the adopters, particularly early adopters, has strong policy relevance. State governments may approve the creation of local economic development policy approaches with little knowledge about whether the voluntary adopters will be among the primary policy targets.

This dissertation should help draw distinctions among the local governments and the policies they chose to pursue. For example: are fiscally challenged counties, poorer counties, or more conservative counties more likely to rely on supply-side policies such as enterprise zones? This dissertation should assist in determining whether the adopters of local economic development policy are among the expected beneficiaries of such policies. Having advanced knowledge about the types of local governments that adopt voluntary economic development programs such as enterprise zones would assist state policymakers in determining whether the policies will benefit their intended local targets prior to creation and implementation.

History of enterprise zones as supply-side policy

Eisinger (1988) was one of the early economic development scholars to draw a distinction between supply-side and demand-side economic development policies. Each will be simply defined here for introductory purposes. Supply-side economic development policies seek to attract businesses from other locations through lower input costs such as land, labor, and taxes. Tax abatements are a key component of supply-side policies. Demand-side economic development policies target entrepreneurship and the creation of new businesses from within rather than attraction of existing businesses from other locations. Entrepreneurial assistance is a key component of demand-side policies.

Scholars have criticized supply-side based tax incentives as a tool for industrial recruitment as being only effective at the margins of intrametropolitan or intraregional competition and a waste of government resources (Eisinger, 1988). Scholars are more encouraged by demand-side policies that seek to build a strong entrepreneurial base as a focus of economic development (Eisinger, 1988).

This study operationalizes local supply-side policy by concentrating on enterprise zones. Enterprise zones are primarily state sponsored programs designated within local jurisdictions on the basis of unemployment rates, poverty levels, median income, or other economic criteria. Firms locating within an enterprise zone receive property, sales, and/or income tax abatements; job training assistance; and other local/state support (Eisinger, 1988; Mossberger, 2000). In a few states the state government designates enterprise zones automatically, yet most states designate enterprise zones within local government jurisdictions on a competitive basis (Eisinger, 1988). State programs vary in structure: rural or urban only, multi-county regions, or housing focused.

Enterprise zones were first conceived in Britain as an technique for spurring inner city development by cutting taxes and government regulation in select geographically designated areas (Butler, 1991). Ronald Reagan endorsed federal enterprise zones in the 1980 campaign; enterprise zones were consistent with Reagan's focus on supply-side approaches as an economic stimulus. The adoption of enterprise zone programs by states occurred in a pattern consistent with diffusion of innovation. Enterprise zone diffusion occurred through an intergovernmental network represented by both vertical and horizontal diffusion elements (Mossberger, 2000). The federal government acted as a vertical influence in two ways. First, the federal government attempted unsuccessfully to pass federal enterprise zone legislation. Although the prospective number of federal zones would have been relatively small, states were prepared to exploit these benefits should the zone materialize (Mossberger, 2000). Second, when federal zones were not enacted, the federal government and supply-side policy advocates within the Reagan administration served as change agents by providing information and encouragement to state governments. National policy organizations such as the Heritage Foundation also played a role in disseminating information about enterprise zone benefits to states (Mossberger, 2000).

Horizontal diffusion also occurred within the intergovernmental policy network. States developed their own opinion leaders and change agents to filter information on enterprise zones. In addition to consulting with Department of Housing and Urban Development, a federal agency, states also consulted with one another for developing enterprise zone legislation (Mossberger, 2000).

The enterprise zone programs eventually adopted by states actually represent a hybrid form of supply-side policy (Eisinger, 1988). These programs contain the tax abatement characteristics associated with early conceptions of enterprise zones, but many programs offer no or limited regulatory relief (Eisinger, 1988). In 1996, 39 states had active or expired enterprise zone programs with the number of enterprise zones varying per state from 2 to 1625 (Wilder & Rubin, 1996).

The 23-year history of enterprise zones provides a rich context for studying the diffusion of innovation among local governments. Limiting the study area to one state allows for in-depth analysis. Illinois was selected because of its documentation in the literature as an example of a moderately successful program (McDonald, 1993) and because of the large number of voluntary adopters within the state provides sufficient population for statistical analysis.

Research statement

The following dissertation chapters provide the academic and methodological framework for examining the determinants of diffusion of supply-side policy innovations among local governments. Internal and external determinants are predicted to play positive and significant roles in the adoption of enterprise zones by local governments. Exploring both internal and external determinants is consistent with calls by scholars to study diffusion through a unified model (Berry & Berry, 1990). These internal and external determinants will be discussed in Chapter 2 and operationalized in Chapter 3.

Organization of this dissertation

Chapter 2 of this dissertation discusses the academic literature on diffusion of innovation. The literature review will be developed around a series of hypotheses to be empirically tested. Organizing the literature review around the hypotheses concentrates the existing academic literature on diffusion of innovation of economic policy and diffusion of less-specific policies at the local government level.

Chapter 3 discusses the methodology utilized to study diffusion. This study utilizes a combined diffusion of innovation model addressing both internal determinants and external influences. As Gray (1994) noted, few authors have examined the internal determinants and external influences in a single study. The study of internal and external factors influencing diffusion requires modeling that considers not just the factors influencing diffusion, but also the time. This requires the use of pooled or binary cross-sectional time series data to predict the probability that a certain unit of government will adopt an innovation in a single year along with the significance of the internal and external factors on adoption (Gray, 1994). This study will rely on Cox proportional hazards modeling (also known as Cox regression or Cox duration model) to explore the determinants of adoption of enterprise zones within Illinois. Logit will be used to offer comparative models. Chapter 3 also operationalizes the hypotheses outlined in Chapter 2.

Chapter 4 provides an overview of the history of enterprise zone programs in the United States and a brief case study on the enterprise zone program in Illinois.

Chapter 5 presents the univariate, bivariate, and logit models, and Chapter 6 the Cox regression, and Chapter 7 presents the results and conclusions.

Chapter 8 summaries the dissertation findings and places these findings with the theoretical context of diffusion of innovation and the practice of economic development policy.

Study limitations

This study provides a unique contribution to the diffusion of innovation and economic development literature by examining the determinants of adoption of supply-side policies in counties in Illinois over a 23-year period. The traditional factors of diffusion, including internal determinants in the form of demographic, social, economic, and political variables and external determinants in the form of regional diffusion, will be examined.

Yet the study of county-level diffusion over a 23-year period presents methodological and practical research challenges which require some components of diffusion be excluded or only cursorily addressed. First, prior diffusion research has found that policy entrepreneurs in the public sector (Mintrom & Vergari, 1998) and product champions in the private sector (Howell, 2005; Howell, Shea, & Higgins, 2005) often play a significant role in diffusion of innovation. Examining individual policy entrepreneurs within a study population of 102 counties over a 23-year study period is not practicable. Therefore, individual policy entrepreneurs will not be examined in detail in this study. Instead, a proxy for policy entrepreneurs and political capital will be utilized by examining whether counties represented or partially represented by primary sponsors of enterprise zone legislation are more likely to adopt. If clear regional diffusion patterns emerge, then a retrospective qualitative analysis will be used to identify possible regional policy entrepreneurs in the form of regional governments/organizations which may have contributed to adoption.

Second, diffusion of policy innovation at the state and local level often occurs because of vertical influences from the federal government (Craw, 2006) or national policy networks (Martin, 2001). Likewise, federal policies can be influenced from learning the states (Mossberger, 1999). The policy being studied here is a state-sponsored program and it is expected that formal vertical influences from the federal government are non-existent.[2] Furthermore, the cases selected for analysis are represented by voluntarily adopted enterprise zones with relatively homogeneous benefits. Enterprise zones exhibit relative fidelity or replication from county to county

[2] While prior studies have demonstrated that vertical influences occurred in the adoption of enterprise zones by states (Mossberger, 2000), no rationale exists to suggest that federal sources would directly influence within state adoption directly. Indirect influence may occur through political or ideological similarities between federal political leaders and county level constituencies, but this is hypothesized and tested in this study.

due to state government requirements on enterprise zone structure.[3] Formal state vertical influence should be controlled for in that enterprise zones are voluntarily adopted and local governments meeting the requirements are eligible for application for enterprise zone designation. To the extent that vertical influences from the state occur, these are expected to be political in nature and captured in the political hypotheses to be outlined in Chapters 2 and 3.

Third, prior studies have demonstrated that the rate and characteristics of diffusion of an innovation are dependent on the characteristics of the innovation itself (Makse & Volden, 2006; Rogers, 1995). Because enterprise zones are homogenous (as are their characteristics) within Illinois and this study only comprises one supply-side policy, the attributes of enterprise zones are largely irrelevant to the research study questions concerning the determinants of diffusion.

Fourth, it is important to note that this study is focused on the diffusion of enterprise zones and the characteristics of adopters and not on examining the effectiveness of enterprise zones as an economic development tool or policy. Examining the effectiveness of each county-level enterprise zone is beyond the scope of this study. Existing literature has documented moderate effectiveness of the Illinois (McDonald, 1993) enterprise zone program studied here. Studying enterprise zones and developing a predictive model of local government adoption of such supply-side policies is interesting, in part, because a wealth of academic literature has found that such policies

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[3] See (Mayer & Davidson, 2000) for a discussion of fidelity versus adaptation and reinvention of innovations.

have generally been only marginally effective or ineffective in generating desired economic development outcomes.[4] Despite their general ineffectiveness, enterprise zones have demonstrated a pro-innovation bias over time and are among the economic development policy tools used by local governments.

[4] Although dated, Eisinger (1988) provided an excellent summary of academic studies documenting the ineffectiveness of enterprise zones.

II: Literature Review

Organization of the literature review

This literature review provides a brief introduction to the relevant literature on diffusion of innovation. The chapter is organized into three sections: 1) a brief overview of the seminal works in diffusion of innovation, 2) summary and critique of local government level diffusion studies, 3) classification of the literature around a set of hypotheses to be tested in this dissertation. The literature supporting the development of these hypotheses is drawn primarily from local level diffusion of innovation studies and diffusion of innovation studies exploring economic policy diffusion. As stated in the introduction, both the areas are largely neglected within the current literature, therefore the literature review is expanded to include additional studies of diffusion of innovation across other policy areas and private sector innovations to support hypotheses development.

Overview of the seminal works

Rogers (1995) is generally credited with developing the seminal work on diffusion of innovations in his early 1960s study of adoption of hybrid corn. Now in its fifth edition, the book *Diffusion of Innovations* is among the most widely cited books in the Social Sciences Citation Index (Dearing & Singhal, 2006). Rogers successfully demonstrated that adopters fall into five general categories: (1) innovators, (2) early adopters, (3) early majority, (4) late majority, and (5) laggards (Rogers, 1995). He also posited that the adoption of diffusion follows a logistic or "s" curve with few adopters in the beginning, many in the middle, and few at the end. The "s" curve has been an enduring component of many diffusion studies.

Earlier studies of innovation exist within the public administration and political science literature. Prior to Rogers work, studies existed mapping the location of cities adopting commission forms of government (Chapin, 1928) and cities adopting city manager forms of government (McVoy, 1940). However, the seminal work within public administration and political science is Walker's (1969) study of state innovations. He determined that innovation was not based on state expenditures but rather regional diffusion (Walker, 1969) which can be visualized as "a succession of spreading ink-blots on a map" (Walker, 1973). Walker engaged in a series of comments with Gray (Gray, 1973) over the nature of state innovativeness and patterns of policy diffusion.

Building on the work of Walker and Gray, most recent diffusion of innovation studies in the policy literature utilize the state as the unit or level of analysis and focus on the internal characteristics of and/or the horizontal interactions among states that drive the policy innovation and adoption process (Gray, 1994; Shipan & Volden, 2005). Within the framework of external influences, previous literature has outlined three basic reasons that states emulate each other: 1) states learn as they borrow successful innovations from other states, 2) states compete with each other to gain competitive advantage, and 3) citizens pressure their own state to adopt the innovative policies of other states (Berry & Berry, 1999).

Local government level policy diffusion studies

The number of studies examining local level policy diffusion have been rather limited both in the scope of the study and in the policy area. Studies include diffusion of city level fluoridation (Crain, 1966), city level gun control (M. L. Godwin & Schroedel, 2000), city level government structure (Frederickson, Johnson, & Wood, 2004), city level adoption of anti-smoking laws (Shipan & Volden, 2005), city level finance officer innovation (Gianakis & McCue, 1997), and city level computer technology adoption (Brudney & Selden, 1995). The only local studies related to economic policies are a study of city level living wage adoption (Martin, 2001), a study of county level siting of prisons as an economic development tool (Hoyman & Weinberg, 2006), and a study of performance measures in local economic development (Lindblad, 2006). Following is a brief overview and critique of key local government level diffusion studies.

Hoyman & Weinberg (2006)

The authors examined the prison siting decisions of 79 rural North Carolina counties from 1970-2000. Twenty-four counties sited prisons over the 30-year study period. In recent years, prisons have been pursued by rural counties as an economic development strategy. The basic research questions examined relate to what types of counties pursue prison adoptions and whether these counties are predominantly poor or minority.

The authors rely on Cox proportional hazard modeling to determine the relative importance of economics, demographics, and politics on prison siting decisions. In event history analysis models, such as Cox, each county is coded 0 until the year of adoption where the county is coded 1. After adoption, the county drops out of the analysis. Innovation variables were categorized into motivation, resources, obstacles, and external influence. The variables were classified as follows with operationalization in parentheses and predicted direction in brackets:

Motivation

- Economic structure (percentage poverty) [+]
- Economic crisis (percentage change in unemployment) [+]

Resources

- Human capital (percentage of college graduates) [-]
- Fiscal capacity (sales tax revenue per capita) [-]
- Political capital (dichotomous, party of sitting governor) [-]

Obstacles

- NIMBYs (percentage owner-occupied units) [-]
- NIMBYs (population density) [-]
- At risk—African Americans (percentage—a measure of environmental justice) [+]

External

- Propinquity-adjacent siting (dichotomous) [+]

Multicollinearity existed between human capital and fiscal capital, so fiscal capacity was dropped from the analysis. The study found human capital and NIMBYism (not-in-my-back-yard) in the form of owner occupied housing & population density were positive predictors of the likelihood of prison adoption. Counties with dense population and more owner-occupied units were less likely to adopt. The authors conclude that prison siting is not a result of environmental racism or economic determinism, but rather a function of NIMBY constituencies.

Unlike prior diffusion studies, no regional diffusion patterns existed.
As the authors state, the utilization of a proportional hazards methodology has two advantages over logit and probit models: 1) the use of event history analysis allows for the study of innovation as a process over time; and 2) it highlights the importance of NIMBY constituencies in prison siting decisions. While Cox proportional hazards modeling is an appropriate analytical tool, problems exist with the operationalization of the variables and application of a difference of means test.

First, the authors apply a difference of means test to provide preliminary evidence of differences between prison adopters and non-adopters. While difference of means tests are commonly reported in studies, the application of a difference of means test is inappropriate in this study. Difference of means tests are applied to statistical samples (preferably random) which are representative of a general population. Unless the authors claim that North Carolina's rural counties are representative of a national sample (which they do not), the application of difference of means tests are inappropriate because the 79 rural counties examined represent an entire population and not a sample. The differences between prison and nonprison counties are real and sample statistical techniques are not appropriate.

Second, the authors utilize sales tax revenue per capita as a measure of fiscal capacity. This variable is dropped due to high multicollinearity with human capital. A better indicator of fiscal capacity would be property tax revenue per capita. Data limitations may exist regarding property tax revenues over time and sales tax data is an easily accessible alternative measure.

In general this is an interesting study and one of the few county level studies of diffusion of economic development policies. The authors reveal important findings in two areas. First, geographical diffusion patterns were not found, which is inconsistent with many prior state level diffusion studies. Second, although prison siting is an economic development tool used by rural counties to create jobs, economics was not a determinant of prison sitings.

Martin (2001)

Martin examined the conditions explaining the adoption of living wage laws by large American cities. From 1994 to 1999, 22 American cities passed living wage laws mandating wages levels for some private sector employers (particularly those contracting with the local government). The adoption of living wage laws by local governments is somewhat surprising and conflicts with the work of Peterson (1981) who posited that local and state governments would not pursue redistributive policies.

Martin found that the adoption of living wage laws followed a national interaction model where local actors interacted with national political networks. Surprisingly, political conditions played a larger role in the diffusion and adoption of living wage laws than economic conditions such as urban poverty.

ACORN (Association of Community Organizations for Reform Now) is the national political network influencing living wage adoption among cities. The significant demographic variable was the population of a city, which had a positive influence on living wage adoption. Two political/geographic variables were significant: 1) the Democratic vote in the 1996 presidential election and 2) the South, which is negatively correlated, but becomes insignificant when union density is considered. The presence of the AFL-CIO network did not have an influence on living wage adoption. An additional examination found that presence of an ACORN chapter was positively correlated with city size, which partially explains the importance of city size on living wage law adoption. Presence of a state capital and percentage of the labor force in the service industry were positively correlated with the presence of an ACORN chapter, but not with living wage law adoption.

The author concluded that the presence of the ACORN chapter alone does not explain adoption, but the presence works with in conjunction with the coalition and other actors to increase the likelihood of adoption. Martin suggested that the focus of living wages on government contracts targets “immobile capital,” which will not result in capital flight.

While Martin does utilize a dummy variable to control for region, he does not discuss the possibility of regional diffusion patterns. The list of 22 adopters reveals heavy concentration in contiguous states. For example adopters include California (n=5) and adjacent states Oregon (1) and Arizona (1), the Midwest (Illinois, Minnesota, and Michigan (6) and the Northeast (New Jersey, New York, Massachusetts and Connecticut) (6). Some regional diffusion patterns may exist as well and localities may be more likely to adopt if other cities in their state have adopted. This study should be updated to determine if the diffusion of living wage laws has continued and to determine how determinants may change over time.

Lindblad (2006)

Lindblad explained the factors impacting the adoption of performance measures in economic development across municipalities. He relied on traditional effectiveness and efficiency indicators as performance measures. Structuralism and agency perspectives provide the underlying theoretical framework to explain why cities adopt or do not adopt performance measures in economic development.

Structuralism posits that economic development activities, including performance measure use, are related to the "fiscal needs and geographic limitations of cities" (648). The structure includes the existing demographic and socioeconomic conditions and competition for economic development impacting the city. The agency perspective focuses on the politics, political arrangements, and local actors as impacting the economic development activities. Agency perspectives include organizational characteristics, local government forms, and external forces, such as the activities of interest group such as business and citizen groups.

The hypotheses state that structure and agency will both explain the adoption of performance measures in economic development. Yet, agency is hypothesized to have more impact on performance measures in economic development than structure.

The findings revealed that a pseudo-r-squared value of .44 for structure and agency models. When the structure and agency were parsed out separately, the unique impact of structure was small (.02) compared to agency (.26). The shared impact of structure and agency was .18. Organizational characteristics had the greatest impact on performance measurement adoption. Cities with written plans were more likely to use performance measurement as were cities partnering with other local governments. The number of incentives offered was found to be a mediating factor for economic development organizational characteristics and performance measurement.

Contrary to prior research, interest groups were less important that organizational structure and agency. I would posit that it is possible that interest groups impact the organizational structure of economic development activities (i.e. are they in-house or contracted to a private agency/chamber) and may indirectly influence performance measures through organizational structure.

Lindblad uses multinomial logistic regression and a host of variables for agency and structure characteristics on a sample of 442 cities. The data sources are an ICMA survey and secondary data sources. It is possible that some of these measures suffer from convergent validity issues as no statistical tests were run to see how the scaled variables were correlated. In other words, how well do lists of variables such as business activism group together and are the variables really measuring the same concept? A simple Cronbach's alpha test would have addressed these issues. Although, it is possible that the ICMA survey is an established survey and these measures have been previous validated. Lastly, it would have been valuable to determine if regionalism or geography played a role in the diffusion of performance measurement.

This article is particularly applicable to economic development policy given the concern over incentives as an economic development tool and the return on investment from incentive packages.

Shipan & Volden (2005)

Shipan and Volden conducted "the first multi-state, multivariate, large-N (675) study" of local government level diffusion of innovation (2). Their study offered three primary contributions: 1) it analyzed horizontal diffusion at the local level focusing on antismoking regulations, 2) it addressed vertical diffusion to determine what impacts state governments have on local adoption, and 3) it addressed venue shopping by policy proponents who may propose policy adoption at one level of government (in this case local) when conditions are not right for policy adoption at another level (in this case state).

The authors found regional effects for antismoking laws in that cities were more likely to adopt the policies if neighboring cities had done so. This was particularly true of smaller and poorer cities which were more likely to be followers. Larger and wealthier cities were more likely to act independently. State laws reduced the likelihood of adoption if a state had a preemption clause. City governments were more likely to adopt if the state legislature was unlikely to do, which the authors cite as evidence of venue shopping by policy advocates. Political variables were also considered and states were viewed as unlikely to adopt when they had strong tobacco lobbyists, weak health organizations, and conservative leaning governments.

The authors utilized logit event history analysis, which they posit yields results similar to the Cox method used in the previously summarized Hoyman and Weinberg study. Other scholars have posited that Cox is preferred over logit-probit models because it does not require the specification of a baseline hazard function and allows for diffusion to be modeled as a process over time rather than a simple dichotomous variable. Diffusion of antismoking laws followed the logistic "s" curve similar to other policy diffusions with a few leaders, a few laggards, and many adopters in the middle.

Traditional internal determinants of diffusion, such as demographic, social, and economic variables, along with regionalism and government structure were examined in the analysis. Regionalism was explored in a unique manner. Rather than just coding a dichotomous variable based on whether or not a neighboring cities had adopted, the authors used "nearest bigger city" to account for the fact that large cities are more likely to be leaders. Additionally, regionalism was examined through the use of a broader variable, proportion of state population with local smoking restrictions.

Although this study was only published as a working paper, it is significant in its contribution as a comprehensive examination of local government diffusion of innovation. It has advantages over state diffusions studies in that the n (675) is considerable larger than the n (50) for state level studies. Further research is needed to determine of the determinants of diffusion of innovation at the local level also hold true across multiple policy contexts.

Goodwin & Schroedel (2000)

The authors examined how local government characteristics and interest group presence led to diffusion of gun control laws within California. The timeframe utilized in the study is four years (1994-1998) and found 55 cities (N=423) considered gun control measures in this period. The authored argued interest group mobilization and presentation of a new policy image of gun violence played an important role in diffusion.

Logit was used to predict which cities would adopt gun control laws based on demographic, political, and economic variables. When regional variables were included, the model successfully predicted adoption/non-adoption outcomes in 93% of cities studied and produced a relatively large pseudo R-squared (Nagelkerke) of .62. The authors noted the relatively short adoption period, primarily 1996 to 1997, did not allow for event history analysis to study adoption.

Table 1: Summary of Local Government Level Diffusion Studies

Study	Study Aim	Unit/Level of Analysis	n/N	Method	Outcome
Hoyman & Weinberg (2000)	Rural Prison Sitings	Counties (NC)	79	Cox proportional hazards	Human capital and owner occupied housing & population density were positive predictors. Counties with dense population and more owner-occupied units were less likely to adopt.
Martin (2001)	Living Wage Ordinance	City (US)	22		Political conditions played a larger role in the diffusion and adoption of living wage laws than economic conditions such as urban poverty
Lindblad (2006)	adoption of performance measures in economic development	City(US)	442	Multinomial logistic regression	Organizational characteristics had the greatest impact on performance measurement adoption. Cities with written plans were more likely to use performance measurement as were cities partnering with other local governments. The number of incentives offered was found to be a mediating factor for economic development organizational characteristics and performance measurement.
Shipan & Volden (2005)	Adoption of Antismoking policies	City(US)	675	Logit	Regional effects for antismoking laws—cities were more likely to adopt the policies if neighboring cities had done so. This was particularly true of smaller and poorer cities which were more likely to be followers. Larger and wealthier cities were more likely to act independently.
Goodwin & Schroedel (2000)	Adoption of gun control policies	City (California)	423	Logit	Adopters had more Democratic and educated populations and higher percentages of Asian-Americans. Regional variables were also significant, although adopter occurred in a short time frame, which did not allow for event history modeling.

Classification of the literature around a set of hypotheses

This dissertation addresses a neglected area in the diffusion of innovation literature by examining the determinants of supply-side policy adoption in the form of enterprise zones by county governments. The following hypotheses are broadly organized around the determinants of innovation, the relative importance of those determinants, and the rate of diffusion of enterprise zones.

Demographic hypotheses

H1: Counties that have a smaller population are more likely to adopt an enterprise zone.

The private sector and state level policy innovation literature suggests that large organizations are more likely to be earlier adopters of innovations (Crain, 1966; Rose & Joskow, 1990). However, local level studies have found contrary results across a variety of policy areas. Study have found that smaller local governments are more likely to adopt antismoking laws (Shipan & Volden, 2005) and administrative innovations (Gianakis & McCue, 1997). The likelihood of adoption by smaller local governments is a function of several variables. To some degree, size is confounded with resources and larger governments employ more resources. Resource capacity is examined in later hypotheses. One function of resources is that small local governments are more likely to follow state level programs such as enterprise zones and less likely to have the capacity to develop innovations from within. Secondly, local governments in less populated areas may have more homogenous populations; increasing the likelihood of the adoption of policy innovations as opposition groups are reduced. Admittedly, an alternative hypothesis might reveal that more homogenous populations are likely to resist enterprise zone adoption as well.

Economic hypotheses

H2: Counties that have greater human capital are more likely to pursue demand-side policies and are therefore less likely to adopt an enterprise zone.

Demand-side policy approaches focus on the ability of government to generate demand from within through entrepreneurial activities (Eisinger, 1988). Governments possessing human capital have more policy options and the need to rely on incentive based policies is reduced. This concept has not been explored in great detail within the current diffusion literature. Prior studies have found no relation between human capital and county adoption of prisons as an economic development strategy (Hoyman & Weinberg, 2006).

H3: Counties that have greater fiscal capacity (i.e. slack resources) have more economic development options and are therefore less likely to adopt an enterprise zone.

Prior studies have found that fiscal capacity or slack resources are positively associated with innovation (Daley & Garand, 2005; Mohr, 1969; Schumpeter, 1961). Other policy studies have found that fiscal crisis or the lack of fiscal capacity influences adoption (Berry & Berry, 1990; Berry & Berry, 1994). Other studies have found that slack resources have no influence on local policy innovation (Brudney & Selden, 1995; Gianakis & McCue, 1997).

It is expected that counties possessing greater fiscal capacity will have more resources to pursue alternative economic development approaches, while counties with less resources will be more likely to rely on state sponsored programs such as enterprise zones.

H4: Counties that suffer from more severe economic crises will be more likely rely on supply-side policies and are more likely to adopt an enterprise zone.

Hypotheses 4 is related to hypothesis 3 in measuring the economic condition of a county. Counties suffering from severe economic crises have limited options for generating economic growth, therefore these counties are more likely to engage in innovative activities and rely on incentives and other supply-side mechanisms to stimulate development. This is worthy of exploration in this study, despite no significant findings in other studies (Boeckelman, 1996; Hoyman & Weinberg, 2006).

Political hypotheses

H5: Counties with a more conservative political orientation are more likely to support supply side policies and are therefore more likely to adopt an enterprise zone.

Prior research has demonstrated mixed results on the influence of political orientation on innovation. Some state level diffusion of policy innovations studies focusing on morality-based policy issues have found political orientation of governors and legislators, distance to election, and the ideology and religious beliefs of citizens influence innovation. Among the policy areas studied include living-will laws (Hays & Glick, 1997), lotteries (Berry & Berry, 1990), state taxes (Berry & Berry, 1992; Berry & Berry, 1994), and criminal justice policies (Makse & Volden, 2006). Political orientation was also an explanatory variable an earlier study of state innovativeness in civil rights, welfare, and education policy areas (Gray, 1973). Other studies have found that political orientation did not influence innovation in other policy contexts, such as ADC/AFDC eligibility reform (Soule & Zylan, 1997). Additional studies have suggested that states look to ideologically similar states for policy learning and emulation (Grossback, Nicholson-Crotty, & Peterson, 2004).

The influence of politics on diffusion of policy innovation at the local level is mixed. Studies have found that decentralized and highly political local governments influence innovation (Gianakis & McCue, 1997). Within the economic policy studies, political orientation has been positively associated with living wage law adoption (Martin, 2001), but not for county prison sitings (Hoyman & Weinberg, 2006). Interest group influences have also been associated with policy change in gun control laws at the local level (M. L. Godwin, 2000).

Enterprise zones have their roots in national supply-side policy (Mossberger, 2000) and are often viewed as a conservative economic development policy approach within the US and Britain (Harrop, 1981). Much of the debate about enterprise zone has been political (Hall, 1982; Massey, 1982; Taylor, 1982) and prior studies have demonstrated that Republican governors are more likely to favor supply-side policies while Democratic governors are more likely to favor demand-side policies (Boeckelman, 1996). Therefore, it is expected that conservative counties will be more likely to adopt enterprise zones.

H6: Counties represented or partially represented by primary sponsors of enterprise zone legislation are more likely to adopt an enterprise zone.

Hypothesis 6 may be construed as measure policy entrepreneurship or as a measure of the political capital of a county. It is expected counties represented or partially represented by legislative sponsors are more likely to adopt. The presence of a legislative sponsor also provides policy entrepreneurship as counties represented by a legislative sponsor will be more aware of the policy option.

Regional diffusion hypotheses

H7: Counties located adjacent to previous adopters are more likely to adopt.

Hypothesis 7 is a measure of regional diffusion or the extent to which adoption by neighboring governmental bodies influences diffusion of innovations. Regional diffusion patterns have been found in studies of policy and other forms of innovation. Early studies of general state innovations demonstrated regional diffusion patterns (McVoy, 1940; Walker, 1969; Walker, 1973). Emulation by nearby states and localities has been found across number policy areas, including lotteries (Berry & Berry, 1990), taxes (Berry & Berry, 1994), environmental policy (Daley & Garand, 2005), antismoking laws (Shipan & Volden, 2005), social security adoption among nations (Collier & Messick, 1975), and criminal justice (Makse & Volden, 2006). Proportion of adopters has been used as an additional measure of regional diffusion in numerous diffusion studies (Grattet, Jenness, & Curry, 1998; Ingram & Simons, 1995; Shipan & Volden, 2005).

Relative effect size hypotheses

H8: Political determinants will have a larger effect size on enterprise zone adoption than economic determinants.

H9: Political determinants will have a larger effect size than demographic determinants.

H10: Demographic determinants will have a larger effect size than economic determinants.

The literature on diffusion of innovation has rarely posited hypotheses on the relative effect size of internal determinants in advance of the study. Yet, findings for a variety of studies have revealed differences in the relative effect size of internal determinants. Surprisingly, studies of local level economic policy have found that political determinants have a larger effect size than both demographic and economic determinants (Lindblad, 2006; Martin, 2001). A similar pattern of influence is expected for enterprise zones, given the ideological and political association of zones as conservative or Republican approaches to economic development.

Demographics and economics have both demonstrated mixed results within the literature. However, it is expected that counties with less population are more homogenous and more likely to pursue the adoption of a state sponsored policy regardless of their economic condition. Furthermore, enterprise zones are designed within specific geographic areas and the economic conditions of those areas may not be as representative of the county where the zones are located.

Rate of diffusion hypotheses

H11: The diffusion of innovation of enterprise zones follows a logistic “S” curve.

It is well documented in the literature (Casetti, 1969; Dearing & Meyer, 2006; Rogers, 1995; Shipan & Volden, 2005) that diffusion of innovation typically follows an S-shaped logistic curve over time with a few adopters in the beginning, many adopters in the middle, and a few laggards at the end. The slope and the asymptote may differ but the general pattern generally holds true (Mahajan & Peterson, 1985). It is hypothesized that the diffusion of enterprise zone adoption by counties in each state will follow a similar diffusion pattern.

III: Research Methodology

This chapter addresses the research methodology used to explore the determinants of enterprise zone adoption by county governments. The chapter will review the research design and data collection techniques, operationalize the hypotheses, and discuss validity issues. Lastly, the chapter discusses the statistical procedures used to test the model of diffusion.

Research design

This study uses Cox proportional hazards modeling, an event history analysis method, to test determinants of policy innovation. Event history analysis is used to predict the probability of a governmental body adopting a policy in a given year if it has not already done so (Gray, 1994). Event history analysis is a general form of survival analysis statistical techniques in which an adopter is coded 0 until the year of adoption, at which time the adopter is coded 1 and then removed from the analysis. It is consistent with prior studies (Berry & Berry, 1999; Daley & Garand, 2005; Hoyman & Weinberg, 2006) using unified models (Gray, 1994) to test the influence of both internal and external determinants on policy innovation. A logit discrete time event analysis model will be used to provide comparative models.

Data collection

This study utilizes a non-random selection of counties within Illinois, a Midwestern state, to serve as the population for examination. The selection of a nonrandom sample of states has been used in previous enterprise zone studies (Mossberger, 2000) and other exploratory studies of state economic development activities (Cozzens et al., 2005). Illinois was selected due to an established enterprise zone program, a large number of counties, and a large number of voluntary enterprise zone adopters, which provides a sufficient N (102) for statistical procedures.

The economic and political data used in this study will be compiled solely from secondary data sources. The data sources include U.S. Census Bureau, U.S. and Illinois Departments of Labor, Illinois Board of Elections, Illinois Departments of Revenue, Illinois Enterprise Zone Associations, Illinois State Legislature, and Illinois Department of Commerce and Economic Opportunity.

Statistical procedures

Methodological choice has been a difficult problem within the broader literature on innovation, in both technological and social innovations such as policy (Tornatzky & Fleischer, 1990), and scholars have noted the difficulty of conceptualization, measurement, and analysis of the innovation process (Bamberger, 1991). Within the policy diffusion literature, event history models have become the preferred method for studying diffusion. Event history analysis within political science dates back to early studies of lottery adoption in the 1990s (Berry & Berry, 1990) and refers to a general class of models used to study policy diffusion (Hoyman & Weinberg, 2006). Various event history analysis procedures have been employed to study diffusion of innovation, including: Cox proportional hazards modeling ((Hoyman & Weinberg, 2006), generalized estimation equation (GEE) extensions of generalized least squares models (Daley & Garand, 2005), logit (Grossback et al., 2004; Shipan & Volden, 2005) and probit (Wareham & Levy, 2002). Event history models such as these are generally preferred because they allow the researcher to include dependent variables over time and test internal determinants and external factors in a single model (Buckley & Westerland, 2004; Gray, 1994). These models rely on pooled or binary cross-sectional time series data with an observation for each independent variable per adopter per year (Gray, 1994).

For this study Cox proportional hazards modeling (hereafter "Cox") (also known as Cox regression or Cox duration models) will be used to the statistical procedure to test the determinants of enterprise zone adoption among counties in each state[5]. Scholars have determined that the pooled or binary time-series data are equivalent to duration data, therefore duration models such as Cox can be applied to this type of data (Box-Steffensmeier & Jones, 1997; Box-Steffensmeier & Jones, 2004). Cox is a semi-parametric survival analysis technique used to study the effects of time dependent and fixed variables on survival (in this case adoption). Each county is coded 0 until the year

[5] See (Box-Steffensmeier & Zorn, 2001) for details on common misspecifications of Cox modeling.

of adoption where the county is coded 1. After adoption, the county drops out of the analysis. Cox has several advantages over logit and probit models of innovation (Jones & Branton, 2005).

First, within Cox there is no need to specify the baseline hazard function. The baseline hazard function is the hazard rate or probability of adoption of a policy over some period of time (Jones & Branton, 2005). Logit and probit assume this probability is invariant overtime (Jones & Branton, 2005), which is an unrealistic assumption for policy adoption modeling over a 23-year period in a study such as this one.

Second, Cox can handle repeat and competing adoptions, unlike logit-probit (Jones & Branton, 2005). This is particularly important for studying innovations such as enterprise zones which can be repeatedly adopted by governments over time.[6] For example, a county may designate more than one zone within its borders. Third, some scholars have argued that Cox better models innovation as a process by considering how long a government survives before adoption rather than as a binary event in logit-probit (Hoyman & Weinberg, 2006).

Using Cox as an analytical technique to study the determinants of diffusion should yield hazard ratios for each variable which can be used to determine the relative probability that each variable has on the likelihood of a county adopting an enterprise zone.

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[6] This dissertation does not analyze repeat adoptions and therefore makes no hypotheses about the likelihood of repeat adoption. The focus here is on initial adoptions and the covariates influencing such adoption.

Some scholars have suggested that the ideal model for Cox application, for example a light bulb experiment, possesses a true zero start time before which failure is logically impossible (Garson, n.d.). In cases of policy application debate may exist regarding the start date. For example, does the enterprise zone "start date" occur at first legislative consideration, at passage of enabling legislation, or at the first local government adoption? Given the lack of a true start date, it is recommended that a sensitivity analysis be conducted to determine if coefficients change as different starting points are used for covariates (Garson, n.d.). This analysis will include a sensitivity by using a start date of 1981 (Reagan inaugurated 1981), 1983 (start date for first county-level adoption in Illinois), and 1985 to provide a start date after first county adoption for comparative purposes.

Prior to applying Cox regression to the data, the following checklist (Figure 1) for using survival analysis will be utilized to examine data suitability (Tabachnick & Fidell, 2001). These checks will be executed as appropriate in the model building chapters of the dissertation.

1. Issues
    a) Adequacy of sample size and missing data
    b) Normality of distributions
    c) Absence of outliers
    d) Differences between withdrawn and remaining cases
    e) Changes in survival experiences over time
    f) Proportionality of hazards
    g) Multicollinearity.

2. Major Analyses
    a) Test of treatment effect, if significant:
        1) Treatment differences in survival
        2) Parameters estimates, including odds ratios
        3) Strength of association
        4) Survival function showing groups separately
    b) Effects of covariates, for significant ones:
        1) Direction of effect(s)
        2) Parameter estimates, including odds ratios
        3) Strength of association

3. Additional Analyses
    a) Contingencies of covariates
    b) Survival function based on covariates alone

Sources: Tabachnick & Fidell (2001): 827

Figure 1: Checklist for Predicting Survival from Covariates, Including Treatment

To lend further credibility to the Cox model, the data will also be analyzed using logit models to determine if covariates or levels of significance change based on the model used. Adoption over time will be separated into categories of early, middle, and later adopters. Bivariate and logit analyses will be used to determine if the significance of variables changes depending on the stage of adoption.

Although difference of means tests are technically incorrect for application to entire populations, these tests will be used to determine differences in key variables among early, middle, late, and non-adopters.

Hypotheses and operationalization of variables

As the literature review in Chapter 2 documents, a series of hypotheses have been developed regarding the determinants of enterprise zone adoption. The hypotheses are grouped into categories around the internal determinants (demographic, economic, political), external determinants (regional diffusion), relative importance, and rate of diffusion. This section discusses the operationalization and measurement of these hypotheses which are outlined in Table 2: Hypotheses. Cox regression allows the use of both time varying and fixed covariates/predictors.

Table 2: Hypotheses

Hypothesis	Studies Using Similar Measures	Operationalization	Level of Measurement	Expected Direction	Covariates
Internal: Demographics					
H1: Counties that have a smaller population are more likely to adopt an enterprise zone.	(Shipan, 2005; Gianakis, 1997)	Measured as annual certified population from US Census Bureau.	Continuous	-	Time dependent
Internal: Economic					
H2: Counties that have greater human capital are more likely to pursue demand-side policies and therefore less likely to adopt an enterprise zone.	(Hoyman, 2006)	Measured as the percentage of college graduates in the most recent decennial census to the year of study.	Continuous	-	Time dependent

Table 2 Continued

H3: Counties that have greater fiscal capacity (i.e. slack resources) have more economic development options and are therefore less likely to adopt an enterprise zone.	(Berry, 1990; Berry, 1994; Hoyman, 2006)	a) Measured as annual property tax revenues or equalized assessed value per capita. b) Sales tax revenue per capita. c) Percentage of property tax base that is nonresidential	Continuous	-	Time dependent
H4: Counties that suffer from more severe economic crises will be more likely rely on supply-side policies and are more likely to adopt an enterprise zone.	(Boeckelman, 1996; Hoyman, 2006)	Measured as difference in annual unemployment rate from state average.	Continuous	+	Time dependent
Internal: Political & Policy Entrepreneur					
H5: Counties with a more conservative political orientation are more likely to support supply side policies and are therefore more likely to adopt an enterprise zone.	(Berry, 1990; Berry, 1994; Martin, 2001; Hoyman, 2006; Hays, 1997)	Measured as deviation from statewide vote for Republicans in two-party vote in most recent presidential election.	Continuous	+	Fixed

Table 2 Continued

H6: Counties represented or partially represented by primary sponsors of enterprise zone legislation are more likely to adopt an enterprise zone.	Numerous studies have found policy entrepreneurs or product champions influence adoption. However, none have used bill sponsorship as a proxy for policy entrepreneurship.	Measured as yes or no for legislation sponsorship for years when sponsor is a representative in the general assembly.	Dichotomous: 0=No 1=Yes	+	Fixed
			External: Regional Diffusion		
H7: Counties located adjacent to previous adopters are more likely to adopt.	(Berry, 1990; Berry, 1994; Shipan, 2005)	Measured percentage of adjacent counties that have adopted.	Continuous	+	Time dependent
			Relative Effect Size		
H8: Political determinants will have a larger effect size on enterprise zone adoption than economic determinants.	(Martin, 2001)	Measured as relative effect size of significant variables.		+	
H9: Political determinants will have a larger effect size than demographic determinants.	(Martin, 2001)	Measured as relative effect size of significant variables.		+	

Table 2 Continued

H10: Demographic determinants will have a larger effect size than economic determinants.	(Martin, 2001)	Measured as relative effect size of significant variables.		+	
Rate of Diffusion					
H11: The diffusion of innovation of enterprise zones follows a logistic "S" curve.	(Shipan, 2005)	Measured as diffusion pattern based on plot of adopters per year over time.			

Internal: Demographic

The internal hypotheses focus on three areas: demographic, economic, and political. The demographic variables will be measured in a standard manner by using the US Census Bureau annual population estimates to determine the population per county. As stated in the literature review in Chapter 2, it is expected that counties with a smaller population will be more likely to adopt an enterprise zone.

Internal: Economic

Three economic hypotheses are also identified. These are operationalized as follows: 1) H2 focuses on the entrepreneurial capacity of a county. Human capital is related to the educational capacity of a county and is therefore operationalized as the percentage of college graduates in the most recent decennial census. A similar measure has been used in previous economic development diffusion studies as a measure of human capital (Hoyman & Weinberg, 2006). It is expected that counties with a higher percentage of college graduates will be more entrepreneurial and less likely to adopt an enterprise zone.

H3 targets fiscal capacity of counties. The fiscal capacity of counties will vary depending on their property tax base, local sales tax revenue, and percentage of property tax base that is nonresidential. It is not posited here that fiscal capacity is one construct that can be represented by combining these variables into a scale. Rather, it suggests that property tax base, local sales tax revenue, and balance between residential and nonresidential tax base are all annual factors influencing the fiscal health of local governments and are among the measures utilized by local economic developers to measure economic development needs. Therefore, these variables should be included and individually tested within the model. To control for population and geographic size differences, property tax revenues (or equalized assessed value) and local sales tax revenue will be examined on a per capita basis. Sales tax revenue per capita has also been used in prior studies as a measure of fiscal capacity (Hoyman & Weinberg, 2006). Annual increases in both property tax revenues are expected in part because of inflation, which could increase the likelihood of heteroscedasticity in the model. To reduce the probability of heteroscedasticity due to inflation effects, property tax assessments per capita and local sales tax revenue per capita are adjusted for inflation using the implicit price deflator and represented in constant dollars (year 2000).

One well accepted principle supported by numerous, multi-state cost of community services studies is that residential development generally consumes more in government services than paid in taxes while nonresidential development is a net positive in property revenue generation (Heimlich & Anderson, 2001.)[7]. Therefore, the percentage of nonresidential property tax base is included in the model.

H4 uses unemployment rates as a measure of economic crises. Unemployment is measured as the difference between a county's annual unemployment rate and the annual state unemployment rate. This measure is also consistent with previous studies as a measure of economic crisis (Hoyman & Weinberg, 2006).

Internal: Political

As the literature review demonstrates, enterprise zones have roots within the Republican Party and was among the policy approaches advocated by Ronald Reagan during his 1980 presidential campaign and during his term as president. H5 is used to measure the degree of conservatism within each county relative to the state average. It is expected that more conservative counties are more likely to rely on supply-side policies. Conservatism is taken at a measure of the deviation from statewide two-party vote for Republicans the most recent presidential election. More conservative counties should have a higher percentage of votes for Republicans than less conservative

[7] The cost of residential development varies depending on numerous factors, including size of household, number of children, location of development (i.e. urban sprawl), and infrastructure extensions. However, the general pattern of residential development being a net loss from fiscal perspective has held true in most cost of community services studies.

counties. Votes in presidential elections have also been used in prior diffusion studies as a measure of political influence (Martin, 2001).

H6 is a de facto measure of political capital and a measure of the impact of policy entrepreneurship. It is expected that counties represented or partially represented by primary sponsors of the enterprise zone legislations within their state are more likely to have the political capital to adopt such programs. These legislators may also act as default policy entrepreneurs with requisite knowledge to assist their counties in adoption. This dichotomous variable is coded 1 while the sponsor is in elected office and coded 0 for counties not represented for a sponsor.

External: Regional Diffusion

H7 measures the effect of regional diffusion by examining whether or not an adjacent county has adopted an enterprise zone. This measure has been used consistently across numerous diffusion studies (Daley & Garand, 2005; Hoyman & Weinberg, 2006) and determines the extent to which a adjacency to an adopting county predicts adoption. As discussed in the literature review (Chapter 2), regional diffusion is a major factor in innovation and is commonly measured through geographic propinquity where counties are coded as 0 if no adjacent counties have adopted and 1 if at least one adjacent county has adopted. To gain a better measure of the relative influence of adopting counties, this study utilized percentage of adjacent counties who have adopted rather than a dichotomous measure.

Relative Effect Size

As the literature review documents, prior studies have found that political determinants often have a larger effect size than economic or demographic variables in diffusion of innovation studies. H8 and H9 measure this by examining the relative effect sizes of these variables. Demographics are expected to have a larger effect size than economics and will be examined in the same manner in H10.

Rate of Diffusion

As the literature review discusses, diffusion studies have long followed a logistics or "s" curve when the number of adopters per year is plotted graphically. H11 will be tested by plotting the number of adopters per year for each state and determining whether this follows a logistic curve.

Innovation equation

These hypotheses and associated literature review were used to develop a predictive innovation equation which will be tested using event history analysis modeling. The equation is as follows:

$Adoption_{i,t} = f\ (population_{i,t},\ human\ capital_{i,t},\ fiscal\ capacity_{i,t},\ economic\ crisis_{i,t},\ conservatism_{i,t},\ policy\ entrepreneurship_{i,t},\ and\ propinquity_{i,t})$

Validity

This section addresses the validity issues associated with this study. The primary validity challenge using event history models, including Cox, in the study of diffusion is the potential for low variance in the dependent variable because few states adopt each year (Gray, 1994). However, as Gray (1994) noted this challenge has not prevented event history models from being successfully used across a variety of policy studies. This analysis is less susceptible to low variance in the dependent variable than state studies because the state used for analysis was selected due to the large number of counties (n = 102) and large number of enterprise zones. The N for this study is nearly double the n for traditional state studies (n = 50) where event history analysis has been used. It is also larger than some recent local government level diffusion studies (for example, Martin, 2001: n = 22 and Hoyman & Weinberg, 2006: n = 79).

External Validity

This generalizability of this study is limited because it relies on a nonrandom sample of counties in a single state. The low number of within state adopters and varying number of counties in some states prevents a true random sample of states. Furthermore, some states automatically designated enterprise zones based on economic criteria, which makes voluntary selection and diffusion irrelevant for analysis. Differing criteria for adoption (or designation in some cases) prevents data pooling across states.

Limited external validity is a common problem for exploratory studies such as this dissertation. However, findings from Illinois may provide some generalizations for diffusion of innovation of supply-side policies within similar Midwestern states. The study should provide a step forward in theory building for local diffusion and lay the groundwork for additional studies.

Content Validity

The hypotheses examined in this study meet the test for content validity because, as the operationalization section of this chapter states, many have been employed in previous diffusion studies. Thus, most of the measures have been previously validated in the literature. Those hypotheses operationalized here that have not been previously tested were developed using finding from prior literature on economic development.

Selection bias

This research is exploratory and I am not positing that the state selected is representative of the population of all states. Within the state analyzed, the entire state population (i.e. all counties) rather than a sample is used for analysis. Therefore, the selection biases problems found in the application of Cox duration models to nonrandom samples are not as applicable to this study (Boehmke, Morey, & Shannon, 2006).

Statistical Validity

Event history models, such as Cox proportional hazards modeling, relies on the same assumptions of linear regression, including no high multicollinearity, random sampling of data, log linearity, and proper model specification (Garson, n.d.). Multicollinearity of the variables will be checked during modeling and proper model specification is assumed given the variables were developed using theoretical literature on the determinants of diffusion of innovation. As stated, Cox is being applied to an entire population of counties, consistent with prior studies (Hoyman & Weinberg, 2006), and the issues of random sampling is not applicable. Cox also assumes that the ratio of hazards is the same across time periods. This will be tested during application using one of the means identified within the statistical literature to test this assumption (Garson, n.d.)

Convergent and Discriminant Validity

Convergent validity relates to the reliability of scales, which is not applicable to this study. Discriminant validity relates to the principle that different constructs should not be so highly correlated that they measure the same item (Garson, n.d.). The only possible violation of discriminant validity is the possibility that enterprise zones are so highly correlated with unemployment or poverty measures that the two constructs measure the same thing. While enterprise zones are sited in part because of poverty or high unemployment as a qualifying requirement, enterprise zones and poverty or high unemployment are two different constructs. Enterprise zones relate to a small geographically distinct area within a county, while poverty or unemployment is calculated on the basis of a larger geographical area. Therefore, while geographically specific unemployment or poverty are components of an enterprise zone, these constructs are unique and discriminant validity is achieved. Correlation methods will be used to test that these are different constructs.

Other validity issues

One additional validity challenge associated with this dissertation is using counties as the unit of analysis to study enterprise zones that may be adopted in unincorporated areas of a county and/or within municipal boundaries. Several reasons exist regarding the appropriateness of using counties as the unit of analysis:

First, all enterprise zones are still located in a county, even if the geographic borders are entirely within a municipality. Counties still abate property taxes even on municipal zones. Property tax abatement is a primary policy component of the Illinois and enterprise zone programs.

Second, in Illinois, enterprise zones are set up and administered by third-party organizations, and the local governments (cities and counties) approve property tax abatements. Thus, no distinction exists between city or county administrative structure in the analysis.

Third, counties provide stable geographic boundaries for investigating change over time. County boundaries never change, which allows for consistent study areas over time. Municipalities annex and change their boundaries over time.

Fourth, counties also provide more available data on an annual basis. More time series data is available at the county level from sources such as the US Census, annual population estimates, unemployment, and voter registration.

The next chapter discussed the Illinois enterprise zone program in more detail.

IV: Case Study: Illinois Enterprise Zone Program

The chapter discusses the development of the Illinois Enterprise Zone Program and outlines the program's tax exemptions. The chapter reviews literature on the effectiveness of the Illinois Enterprise Zone Program and provides information on adoption each year.

Legislative History & Program Structure

Illinois was the first state in the United States to pursue passage of state enterprise zone legislation, even predating federal government adoption attempts (Mossberger, 2000). In 1979, State House of Representatives member Donald Trotten, a republican from suburban Cook County on the outskirts of Chicago, authored and sponsored enterprise zone legislation which included both tax and regulatory exemptions (Mossberger, 2000). The original legislation, which passed the house, but failed in the state senate, restricted benefits to small businesses, offered minimum wage exemptions, and lessen health and safety regulations (Mossberger, 2000).

In 1982, Totten (now a state senator) sponsored Senate Bill 1299, a modified version of his original enterprise zone bill, which passed the senate and house and was signed into law as Public Act 1299 scheduled to take effect December 7, 1982 (McDonald, 1993; Mossberger, 2000). The adopted enterprise zone legislation did not contain the health and safety or minimum wage exemptions and the benefits had been extended to large businesses. These compromises represented concessions made by Trotten and recommended by a governor's task force. These changes also mirrored the trend found in enterprise zones adopted in other states prior to the passage of the compromised legislation in Illinois (Mossberger, 2000).

The first eight enterprise zones were certified in 1983 and the program authorized the creation of eight zones per year for six years (the program was amended to allow for more than eight zones per year starting in 1984) (McDonald, 1993). Enterprise zones were administered by the Illinois Department of Commerce and Community Affairs (DCCA) (the agency has been renamed to Department of Commerce and Economic Opportunity) and designated for a period of 20 years (McDonald, 1993), although most zones have been renewed for an additional period of time.

Each zone was originally established for a period of 20 years. Half of the zones nearing expiration had their termination dates extended an additional 10 years in 2003. The original program requirements also limited zone designation on a competitive basis based on unemployment, income, poverty, or population loss criteria (McDonald, 1993). Although enterprise zones are administered by a state agency, local governments and community groups play an important role in seeking zone designation and in day-to-day operations (McDonald, 1993).

The benefits of the enterprise zone include sales tax exemption on permitted building materials and equipment, utility tax exemptions, investment and job tax credits, and various income tax deductions. While the exemption varies by zone, county level property tax exemptions and reductions are also included. The Illinois Development Finance Authority has also established $100 million for lending exclusively in enterprise zones. The benefits of the enterprise zone are available to companies locating, expanding, or retaining jobs in the zone (IEZ Brochure, 2005).

Program Effectiveness

While it is not the intent of dissertation to assess the success of the Illinois Enterprise Zone Program, it was selected in part due to documentation in the literature depicting the program as having a moderately successful impact on economic development. McDonald (1993) found growth in the distributional sector (wholesale trade and transportation) most likely due to the capital intensive subsidies contained in the enterprise zone program. However, little support was found for enterprise zone's stimulating economic activity that would not have occurred in their absence and McDonald noted that the original intent of enterprise zones serving depressed areas appears to have been lost with the proliferation of multiple zones across the state. This dissertation will test whether McDonald's assertion by examining if different economic characteristics exists for later adopters.

Adoption History

From 1983 to 1992, 88 enterprise zones were created. Seven additional zones were created from 1992 to 2004 under authorization from the Quad Cities Regional

Economic Development Authority Act, Southwestern Illinois Economic Development Authority Act, the Upper Illinois River Valley Development Authority Act, and the military base closure provisions in the Illinois Enterprise Zone Act (IEZ, 2005). This analysis excludes additional seven zones not adopted within the guidelines of the original program. Table 3 outlines enterprise zones adoption by year. It should be noted that more than one zone may be adopted by in each County, for example Cook County (County containing City of Chicago) had two enterprise zones adopted within its boundaries in 1983.

Table 3: Enterprise Zones Created By Year

1983	8
1984	12
1985	12
1986	15
1987	12
1988	9
1989	0
1990	14
1991	8
1992	0
1993	1
1994	0
1995	0
1996	0
1997	1
1998	0
1999	0
2000	1
2001	0
2002	0
2003	1
2004	1
Total	95
(includes counties with multiple zones) Source: Thomas Henderson, Administrator of the Illinois Enterprise Zone Program, Illinois Department of Commerce and Economic Opportunity, 11/29/05	

Table 4 demonstrates the number of counties with an enterprise zone adopted within its borders for the first time.

Table 4: Number of New County Adopters Per Year

Year	Number of Adopters	Cumulative Adopters
1983	7	7
1984	7	14
1985	11	25
1986	5	30
1987	12	42
1988	9	51
1989	0	51
1990	11	62
1991	5	67
1992	0	67
1993	1	68
1994	0	68
1995	0	68
1996	0	68
1997	0	68

Figure 2 depicts this annual adoption graphically by showing the number of new county adopters per year beginning with the first adoption in 1983 and the last in 1993.

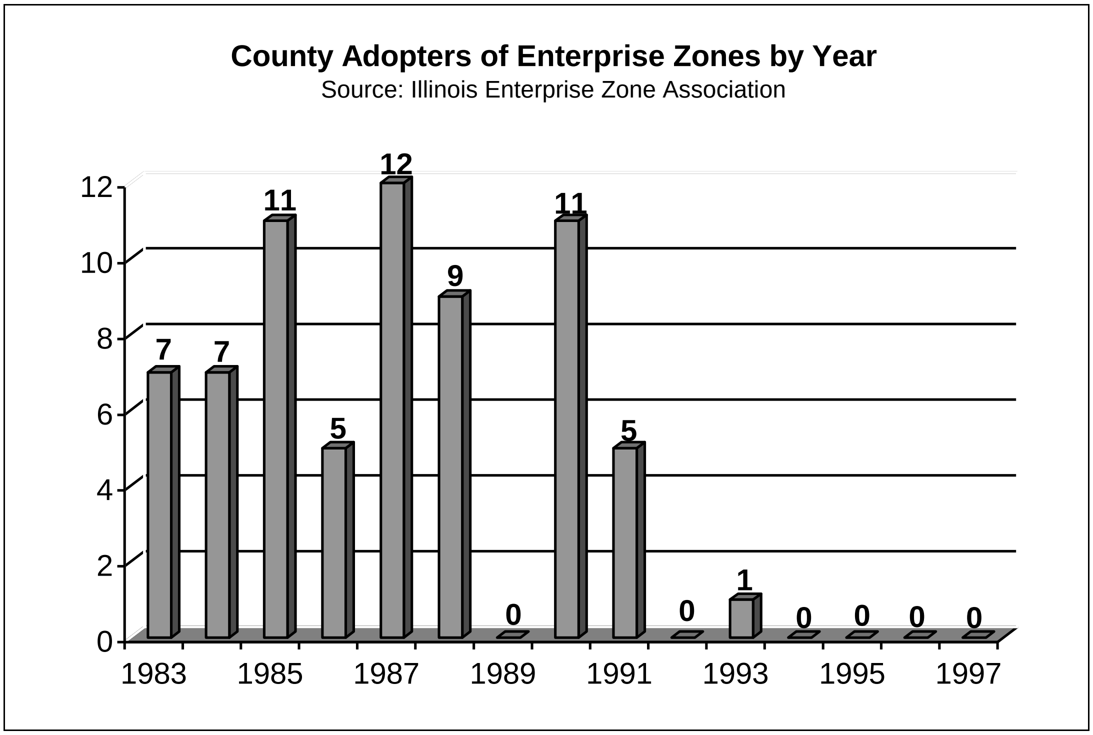


Figure 2: County Adopters of Enterprise Zones by Year

Figure 3 demonstrates the initial geographic dispersion of enterprise zone adoptions in 1983, the first year of the program. Seven counties adopted the initial eight zones (Cook County had two zones). Three zones were in northern Illinois, three zones in central Illinois, and one zone in southern Illinois.

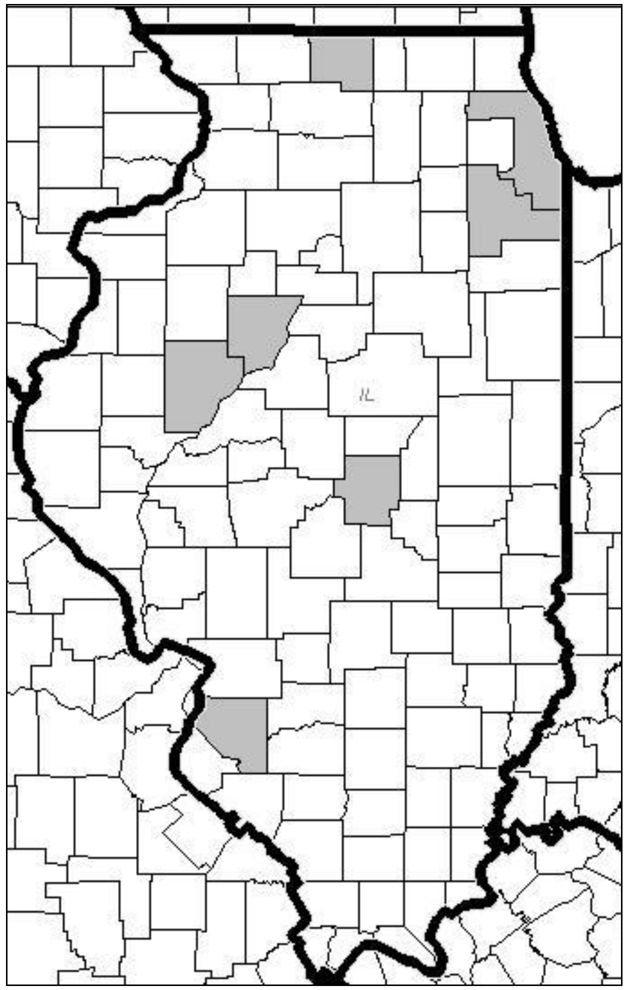


Figure 3: 1983 Illinois Enterprise Zones

Table 5 depicts the percentage of county adopters by stage in the adoption process. Approximately 37 percent of the counties adopting for the first time adopted in the first three years of the program's existence. Another 38 percent were middle stage adopters adopting during the fourth, fifth, or sixth year of the program. The laggards or last adopters occurred between 1989 and 1993, the seventh and tenth years of the program's existence. No counties adopted for the first time after 1993, although data was collected on all counties, including non-adopters until 2003 for statistical analysis purposes.

Table 5: Stages of Adoption

Adoption Status	Time Period	Counties Adopting	Percentage of Total Adopters
Early Adopters	1983 to 1985	25	36.8%
Middle Adopters	1986 to 1988	26	38.2%
Late Adopters	1989 to 1993	17	25.0%

Figure 4 lends some support to hypothesis 11, which suggests that cumulative adoption of enterprise zones follows a logistic curve with some early adopters, many middle adopters, and fewer late adopters.

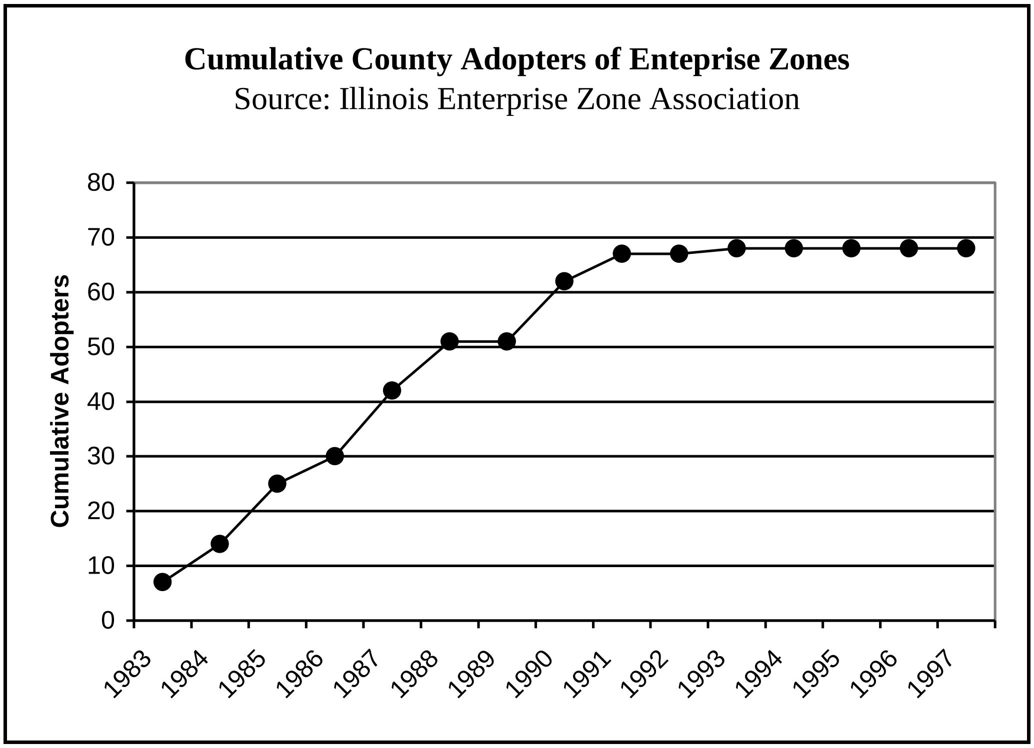


Figure 4: Cumulative County Adopters of Enterprise Zones

Figure 5 is a map of the 2004 enterprise zones. It contains seven additional zones, which were created from 1992 to 2004 under authorization from the Quad Cities Regional Economic Development Authority Act, Southwestern Illinois Economic Development Authority Act, the Upper Illinois River Valley Development Authority Act, and the military base closure provisions in the Illinois Enterprise Zone Act (IEZ, 2005). These zones are not included in this study. It should be noted that the numbers for each zone represent a designation code by the Illinois Department of Commerce and Economic Opportunity and do not correspond with adoption dates.

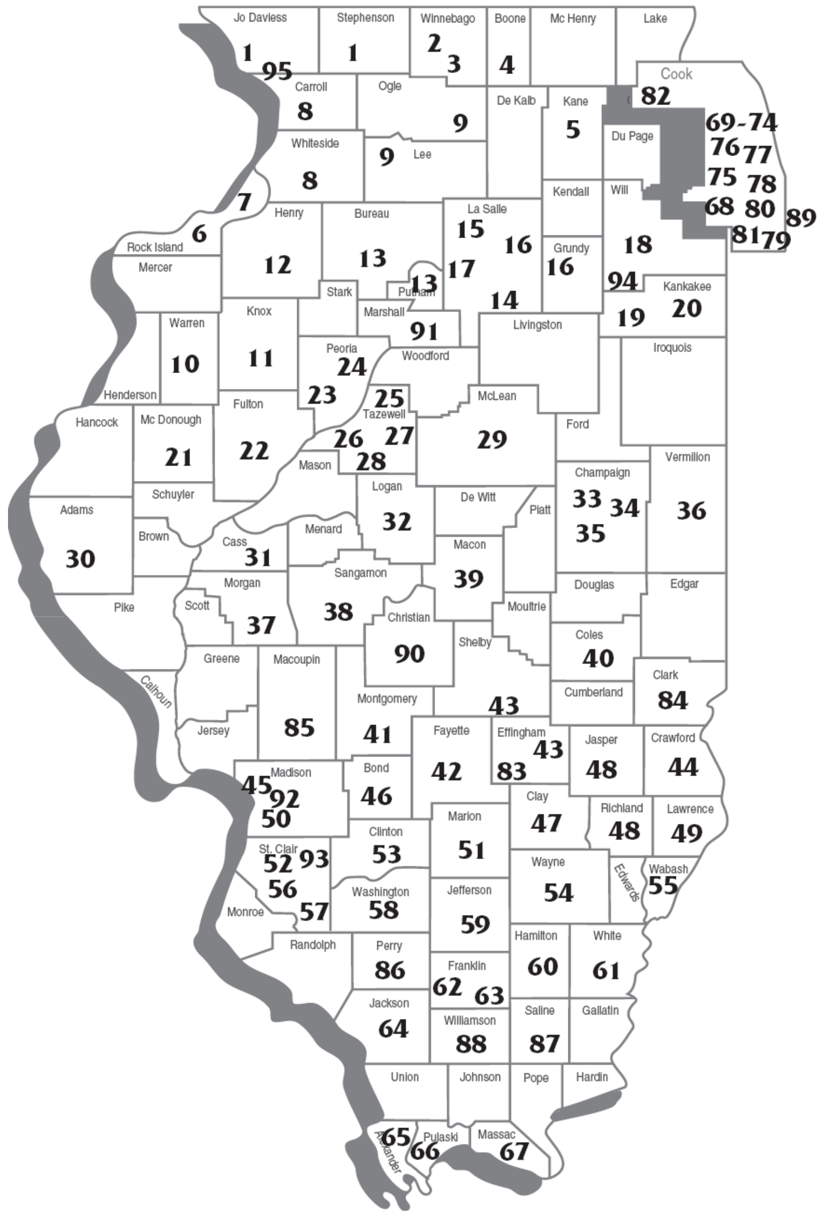


Figure 5: Map of Illinois Enterprise Zone (April 2004)
Source: Illinois Department of Commerce and Economic Opportunity

V: Model Building: Univariate, Bivariate, and Logit

The chapter provides a comprehensive description of the modeling building utilized to examine the effect of predictors on enterprise zone adoption. It begins with an univariate analysis of the predictor variables or covariates (independent variables) and dependent variable used in the event history models to assess the suitability of these data for event history analysis and to gain a better understanding of the data. Binary analysis is utilized to examine relationships between the predictor and dependent variable. The model building chapter concludes by utilizing logit models for a collapsed data for all adopters and logit models for early, middle, and late adopter periods. A Cox regression is then conducted to determine which covariates predict enterprise zone adoption over the study period.

The research relies on pooled or binary cross-sectional time series data compiled by the research from a time period 1981 to 2003. There are no missing values within this time period. Additional data for 1980 and 2004 were compiled by the researcher, but both contain missing values dues to data limitations and these years are not included in the analysis.

Normal distribution is assumed for most tests of significance, which “test the null hypothesis that the strength of an observed relationship is not different from what would be expected due to the chance of random sampling” (Garson, n.d.). The data used is this research is drawn from a population of counties within Illinois, and therefore sample statistical techniques to compare samples to the population from which they are drawn are not utilized. Sample statistics are inappropriate as the dissertation does not try to generalize to a broader population of county adopters. Gross differences in underlying distributions of variables across the population are not expected and therefore transformation of variables to correct for non-normality is not expected to yield improved findings. Additionally, the interpretation of transformed variables becomes difficult and almost nonsensical in hazard modeling.

However, in cases where the data are not normally distributed, transformations of the data will be executed and explained. Logarithmic, squared, or other appropriate transformations of non-normally distributed data will be tested in the model to determine if the significance of the results changes with inclusion of transformed variables. Where the significance of the results do not change and/or the transformation of the data do not improve findings, the original, untransformed variables will be utilized to provide easier interpretation of findings. Cook County, which contains the City of Chicago, has the largest population in Illinois and its presence as an outlier contributes to non-normality in the distribution of several variables. An analysis of the data excluding Cook County will be executed as well.

The continuous and dichotomous covariates used in this analysis are both time varying and fixed. The following section provides additional details on these variables and the univariate analysis. Summary statistics for each covariate will be presented along with histograms and probability plots. A probability-probability plot, which compares an empirical cumulative distribution function of a covariate with a standard normal distribution function, was also executed. Both graphs coupled with the summary statistics will be used to determine if the data is normally distributed or if it must undergo transformation. Traditional measures of skewness and kurtosis states that these values must fall within a range of -3 to +3 when data is normally distributed.

Summary Statistics-Collapsed Data

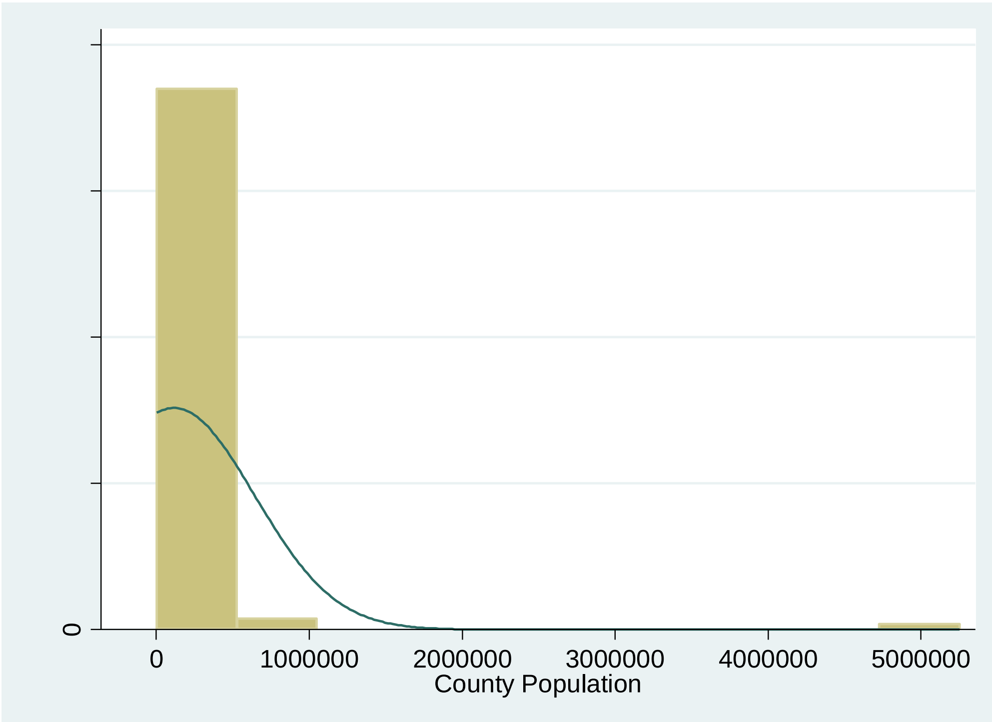
This section presents summary statistics on the average value for each variable over the 23 year study period. Data are collapsed to provide a simpler dataset for summary statistic analysis and to conduct a logit analysis comparing adopters to non-adopters over the study period.

Population and Population Density

The annual certified county population was taken from the US Census Bureau for each county (102) in Illinois over the 23 year period. The square miles of land area for each county were also obtained from the US Census Bureau to calculate population density. Summary statistics, histogram and probability plot follow.

Table 6: County Population Statistics

County Population		
Statistics		
Mean		116026.30
Standard Deviation		526072.10
Confidence Intervals (95%)	12695.94	219356.70
Skewness		9.27
Kurtosis		90.75
n =		102



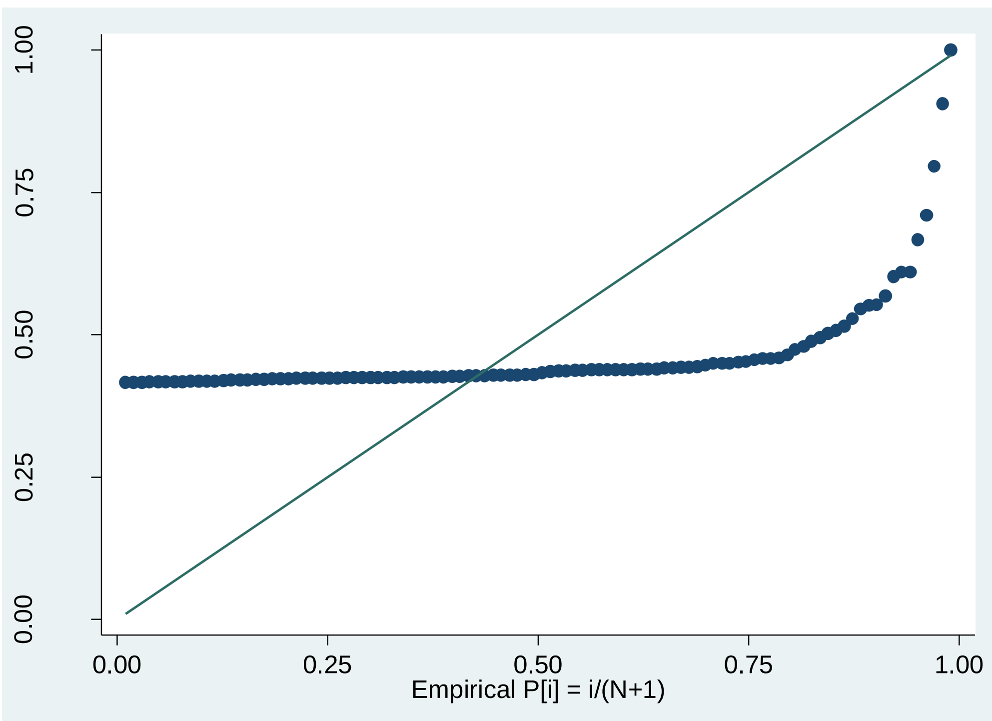


Figure 6: County Population Histogram and Probability Plot

The findings that population data is not normally distributed in Illinois is not surprising given the large metropolitan region of Chicago (Cook County) and the heavily populated suburban border counties. Skewness and kurtosis both indicate the data is not normally distributed with a positively skew (9.2) and very large peak (90.7). County population density is examined next to determine its distribution and summary statistics. The analysis reveals that population density also exhibits a positive skew and large peak.

Table 7: County Population Density Statistics

County Population Density		
Statistics		
Mean		171.21
Standard Deviation		597.28
Confidence Intervals (95%)	53.89	288.53
Skewness		7.81
Kurtosis		67.87
n =		102

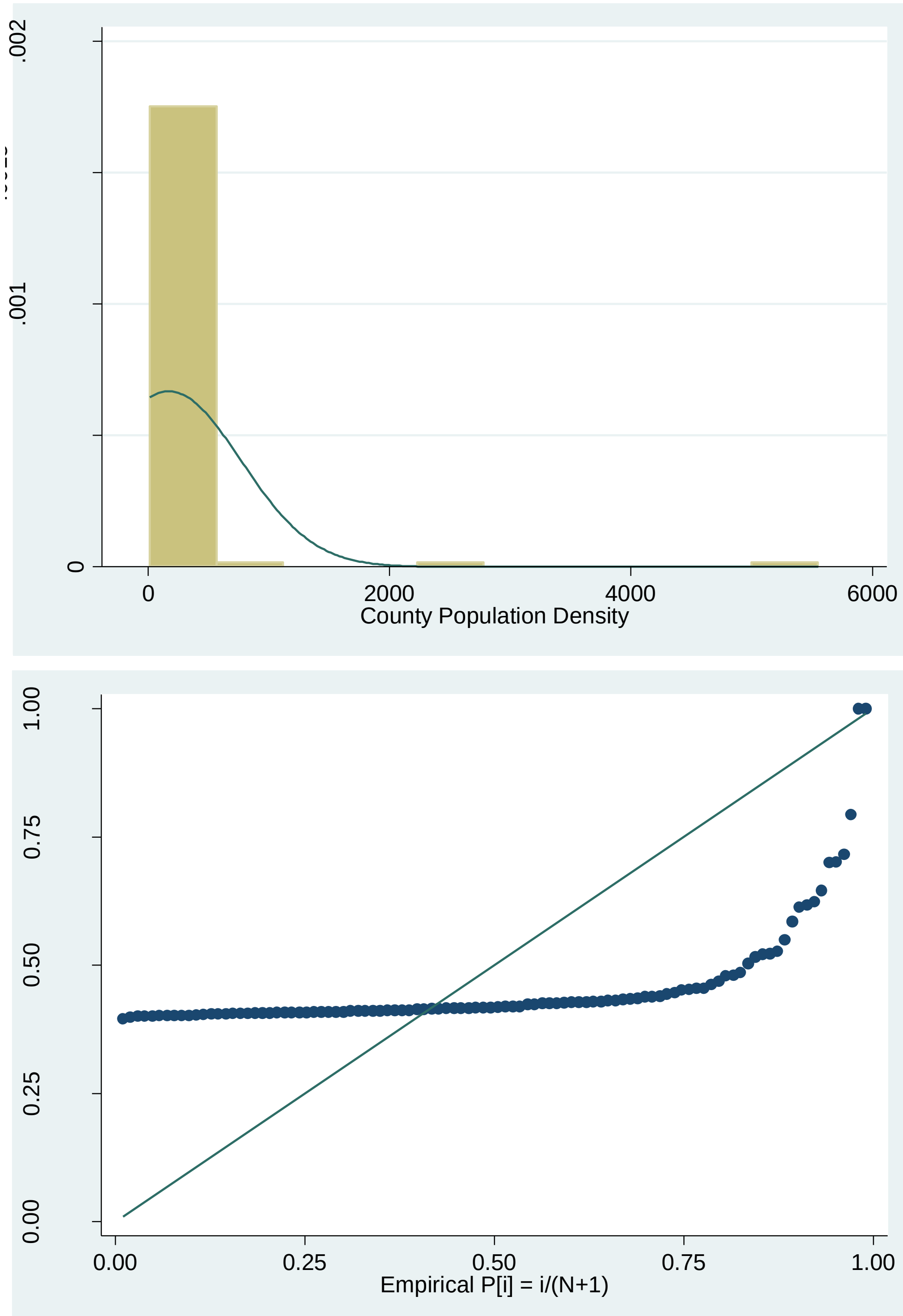


Figure 7: County Population Density Histogram and Probability Plot

A log transformation of the population variables was undertaken to determine if the population and population density covariates would approach normality.

Table 8: County Population Transformed

County Population				
Statistics	**Untransformed**		**Transformed (Log)**	
Mean		116026.30		10.39
Standard Deviation		526072.10		1.22
Confidence Intervals (95%)	12695.94	219356.70	10.14	10.63
Skewness		9.27		1.16
Kurtosis		90.75		5.11
n =		102		102

The log transformation greatly reduced the skewness to within acceptable limits, but the kurtosis still exceeds the +3 threshold. A similar transformation is undertaken for County Population Density.

Table 9: County Population Density Transformed

County Population Density				
Statistics	**Untransformed**		**Transformed (Log)**	
Mean		171.21		4.17
Standard Deviation		597.28		1.04
Confidence Intervals (95%)	53.89	288.53	3.96	4.37
Skewness		7.81		1.59
Kurtosis		67.87		6.32
n =		102		102

Summary statistics for the log of County Population Density also corrects for skewness but not kurtosis. This may warrant removal of Cook County from the analysis to examine whether covariate significance and directions changes within the model.

Human Capital

Human capital is measured as the difference in the percentage of college graduates within a county compared to the state average using the most recent decennial census to the year of the study. Summary statistics, histogram and probability plot follow.

Table 10: College Graduate Statistics

Difference in Percentage of College Graduates		
Statistics		
Mean		12.47
Standard Deviation		5.68
Confidence Intervals (95%)	11.35	13.58
Skewness		1.97
Kurtosis		6.89
n =		102

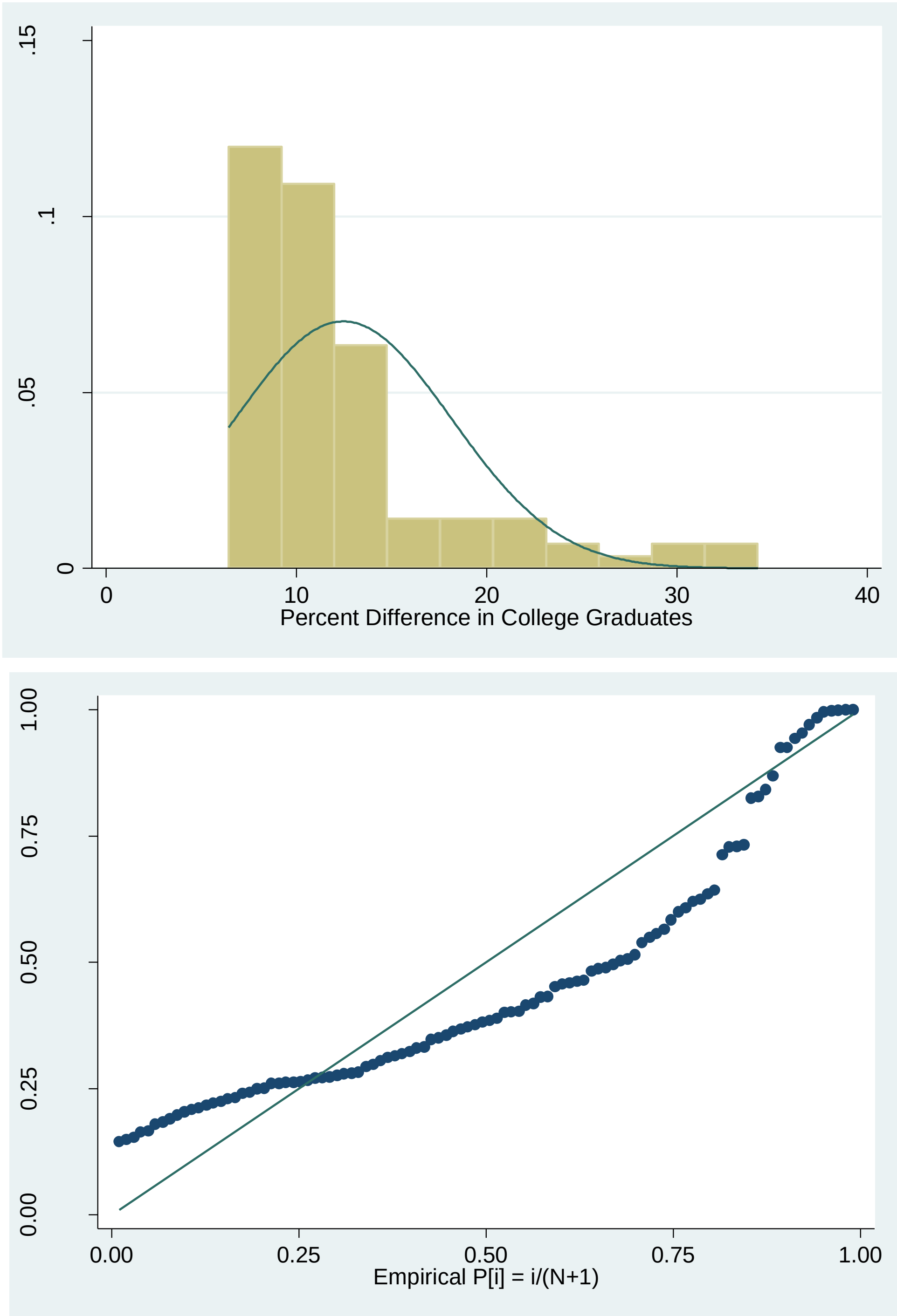


Figure 8: College Graduates Histogram and Probability Plot

While the skewness calculation is within range, the kurtosis measure exceeds the +3 threshold. A log transformation was also conducted for this variable. The transformation failed to bring the kurtosis measure with the +3 threshold, but did lower it to 3.7.

Table 11: College Graduates Transformed

Difference in Percentage of College Graduates				
Statistics	**Untransformed**		**Transformed (Log)**	
Mean		12.47		2.45
Standard Deviation		5.68		0.37
Confidence Intervals (95%)	53.89	288.53	2.37	2.52
Skewness		1.97		1.00
Kurtosis		6.89		3.70
n =		102		102

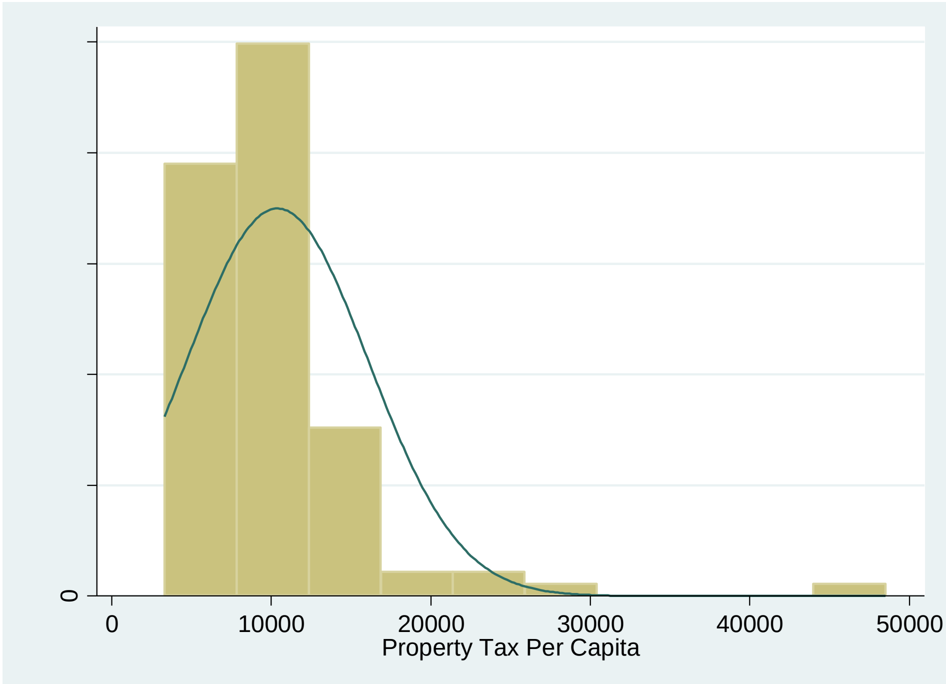
Fiscal Capacity

Fiscal capacity is measured in the form of annual property tax equalized assessed value per capita and annual sales tax income per capita. Both are inflation controlled and represented in 2000 dollars. Percentage of property tax base that is nonresidential is also represented as a measure of fiscal capacity.

Summary statistics, histogram and probability plot are presented below for property tax assessed value per capita.

Table 12: Property Tax Assessed Per Capita Statistics

Property Tax Assessed Value Per Capita		
Statistics		
Mean		10383.24
Standard Deviation		5703.27
Confidence Intervals (95%)	9263.01	11503.47
Skewness		3.64
Kurtosis		22.40
n =		102



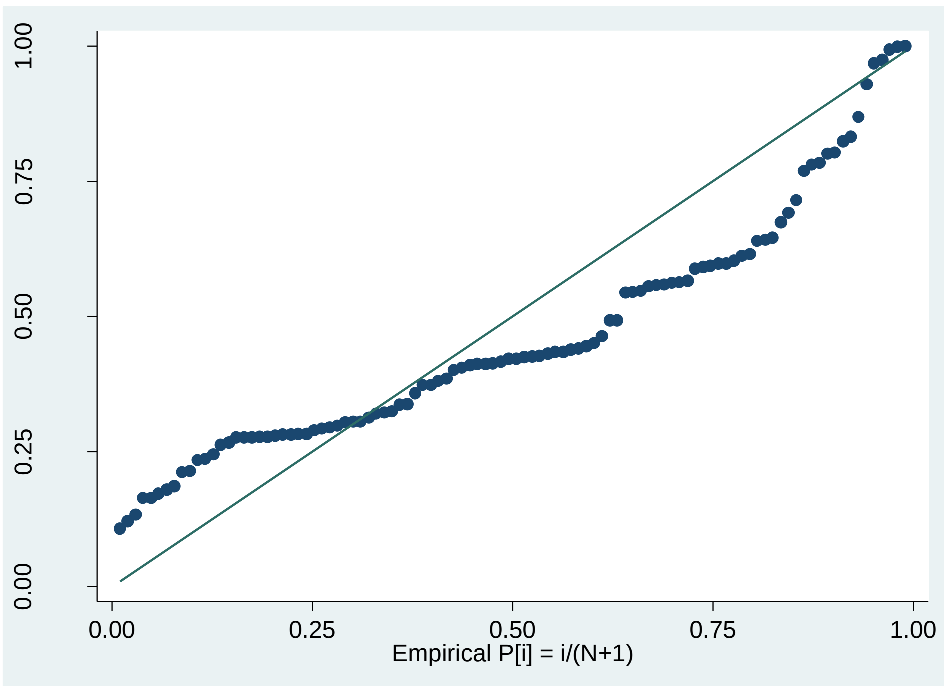


Figure 9: Property Tax Assessed Per Capita Histogram and Probability Plot

This data exhibits similar kurtosis challenges. A log transformation fails to bring the kurtosis within acceptable limits.

Table 13: Property Tax Assessed Per Capita Transformed

Property Tax Assessed Value Per Capita				
Statistics	**Untransformed**		**Transformed (Log)**	
Mean		10383.24		9.15
Standard Deviation		5703.27		0.41
Confidence Intervals (95%)	9263.01	11503.47	9.07	9.23
Skewness		3.64		0.67
Kurtosis		22.40		5.12
n =		102		102

Summary statistics, histogram and probability plot are presented below for sales tax revenue per capita.

Table 14: Sales Tax Revenue Per Capita Statistics

Sales Tax Revenue Per Capita		
Statistics		
Mean		69.88
Standard Deviation		22.96
Confidence Intervals (95%)	65.37	74.39
Skewness		0.43
Kurtosis		3.39
n =		102

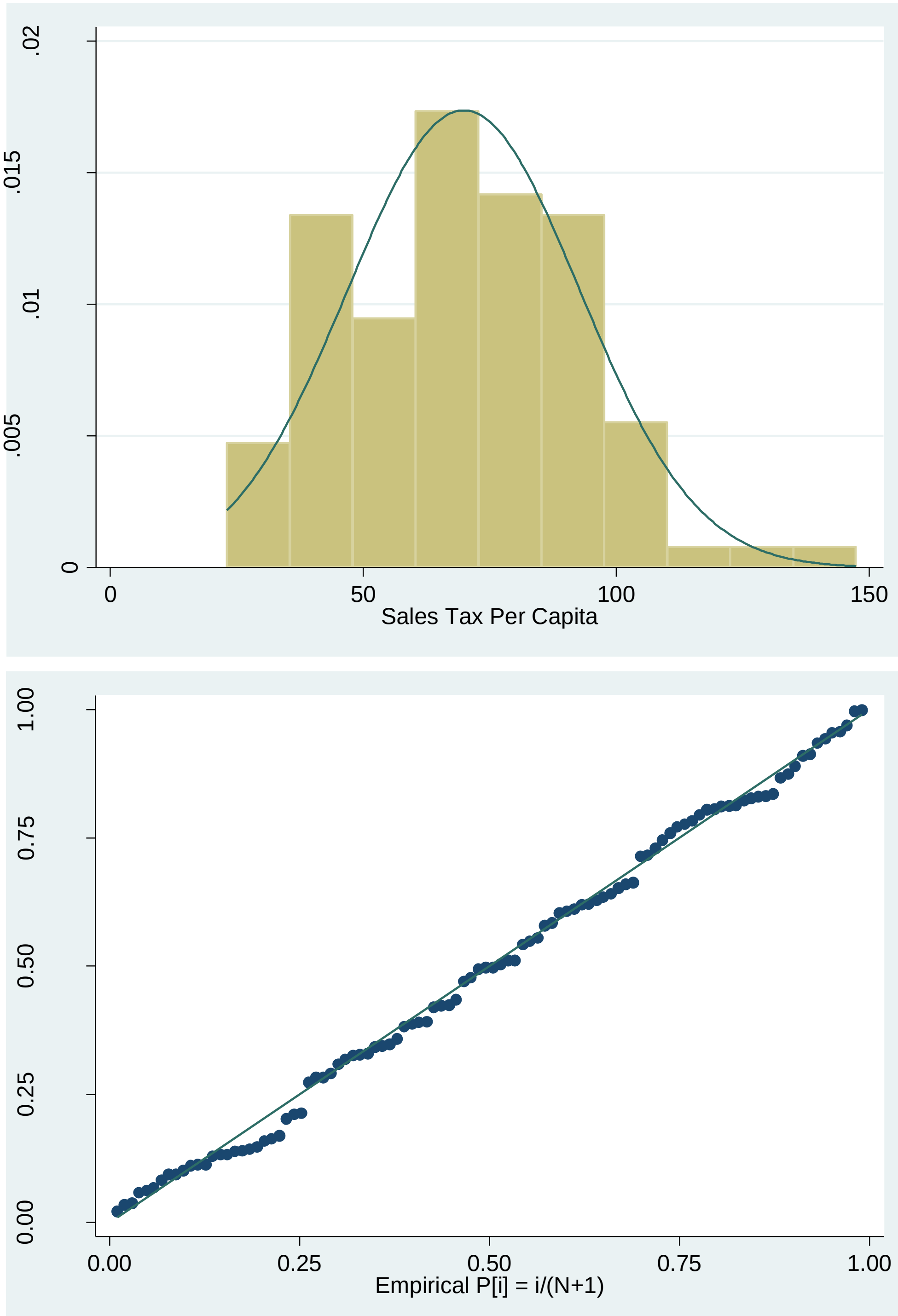


Figure 10: Sales Tax Revenue Per Capita Histogram and Probability Plot

Sales tax revenue per capita slightly exceeds the threshold for kurtosis, but the variable will not be transformed as transformation is unlikely to impact the results.

Percentage of Non-residential tax base

Tests for percentage of nonresidential tax base reveal the variable is normally distributed.

Table 15: Percentage Non-residential Tax Base Statistics

Percentage Non-residential Tax Base		
Statistics		
Mean		0.55
Standard Deviation		0.14
Confidence Intervals (95%)	0.53	0.58
Skewness		-0.22
Kurtosis		2.45
n =		102

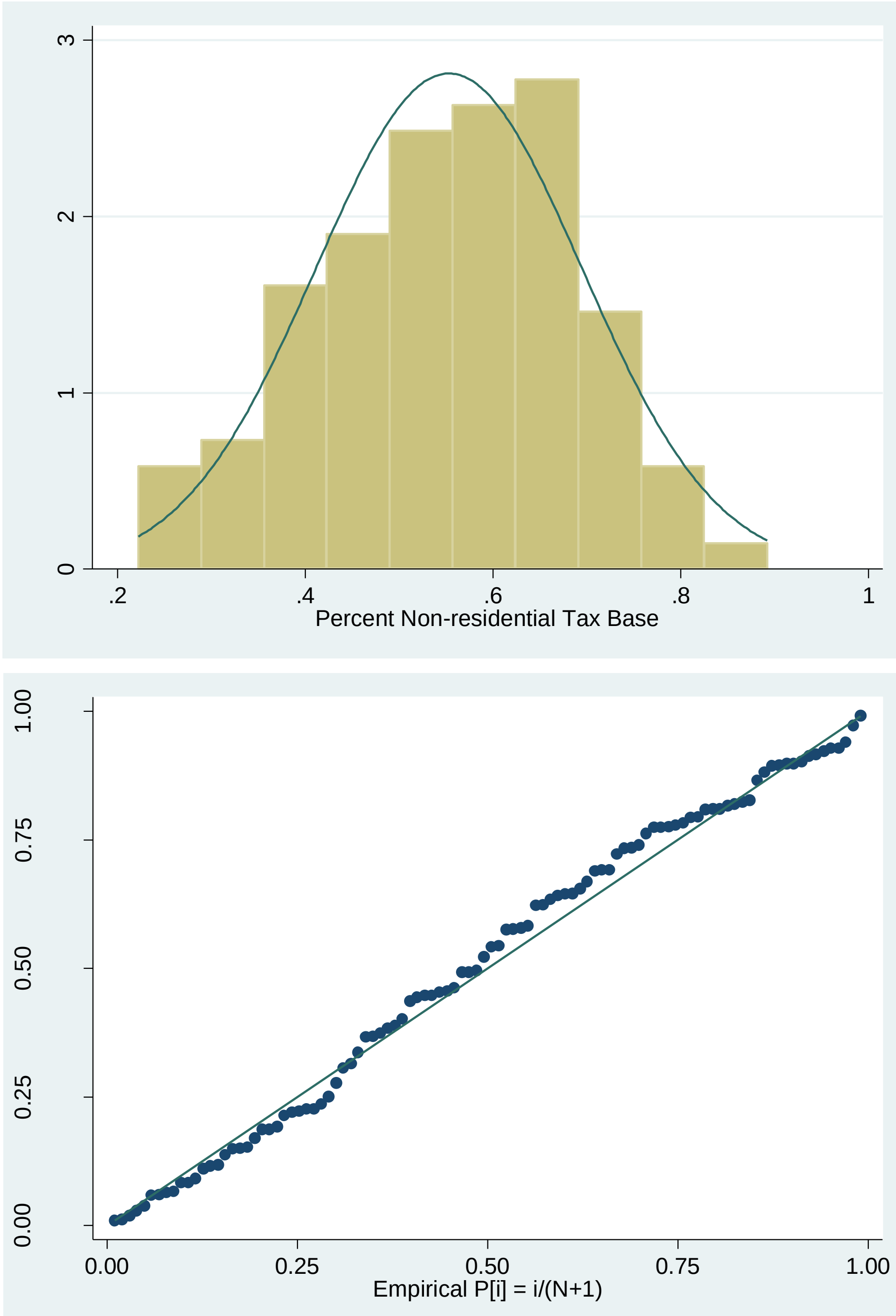


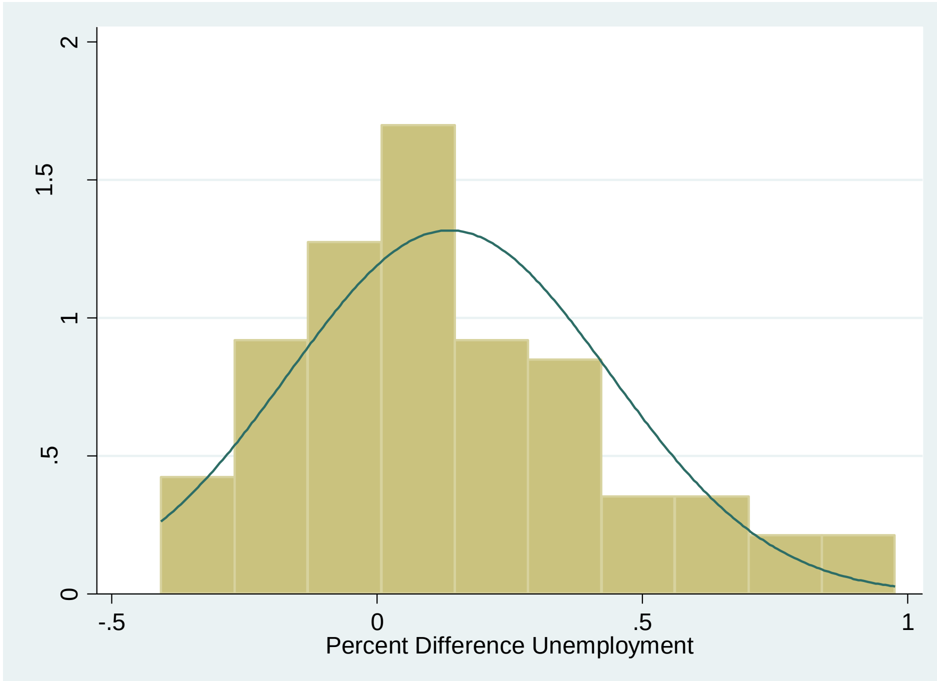
Figure 11: Percentage Non-residential Tax Base Histogram and Probability Plot

Economic Crisis

Economic crisis is measured as the percentage difference in annual county unemployment rate from the state average. This data is nearly normally distributed and will not be transformed.

Table 16: Percentage Difference in Unemployment Statistics

Percentage Difference in Unemployment		
Statistics		
Mean		0.14
Standard Deviation		0.30
Confidence Intervals (95%)	0.08	0.20
Skewness		0.72
Kurtosis		3.11
n =		102



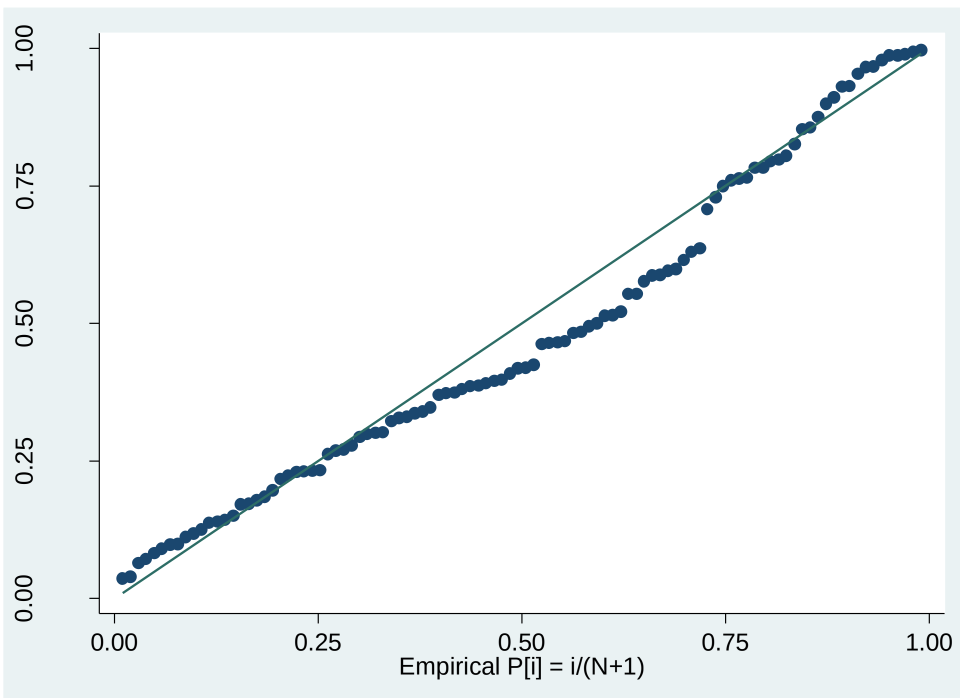


Figure 12: Differences in Unemployment Histogram and Probability Plot

Conservative political orientation

Conservative political orientation was measured as the percentage difference in presidential support for republicans using a two party vote relative to the state average for in the most recent presidential election to the study year. Tests reveal the data are normally distributed.

Table 17: Difference in Presidential Support for Republicans Statistics

Percentage Difference in Presidential Support for Republicans		
Statistics		
Mean		0.067
Standard Deviation		0.067
Confidence Intervals (95%)	0.05	0.08
Skewness		-0.11
Kurtosis		2.54
n =		102

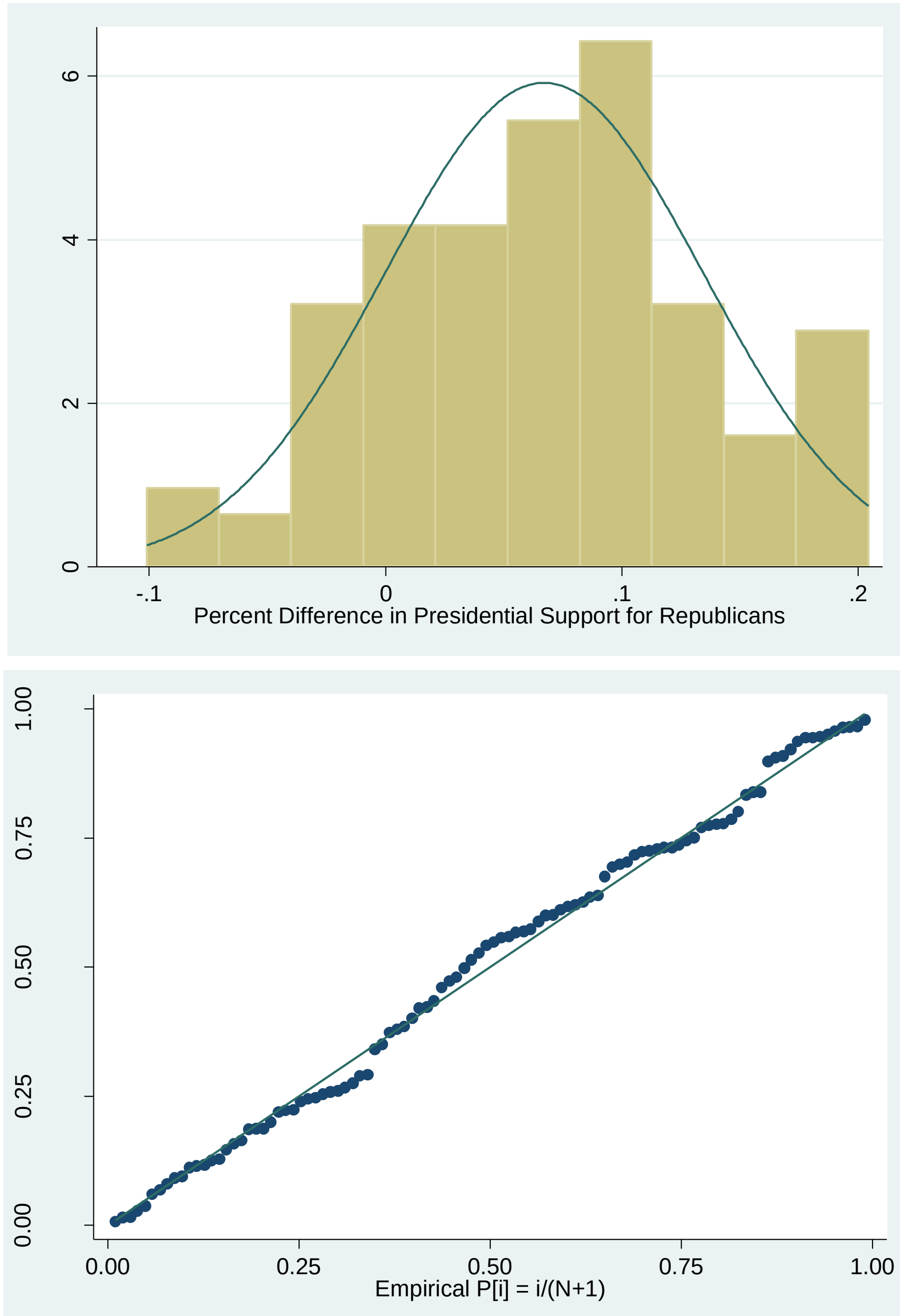


Figure 13: Presidential Support for Republicans Histogram and Probability Plot

Regional Diffusion-Percentage of Adjacent Adopters

Regional diffusion was measured as the percentage of adjacent adopters for each county. Regional diffusion was also measured as a dichotomous variable coded 1 for an adjacent adopter and 0 for no adjacent adopters. Results are reported in the dichotomous variables section. Tests reveal the data is normally distributed. The variable percent of adjacent adopters demonstrates slightly high levels of kurtosis, but is not expected to alter the findings.

Table 18: Percentage of Adjacent Adopters Statistics

Percentage of Adjacent Adopters		
Statistics		
Mean		0.50
Standard Deviation		0.17
Confidence Intervals (95%)	0.47	0.54
Skewness		-0.65
Kurtosis		3.55
n =		102

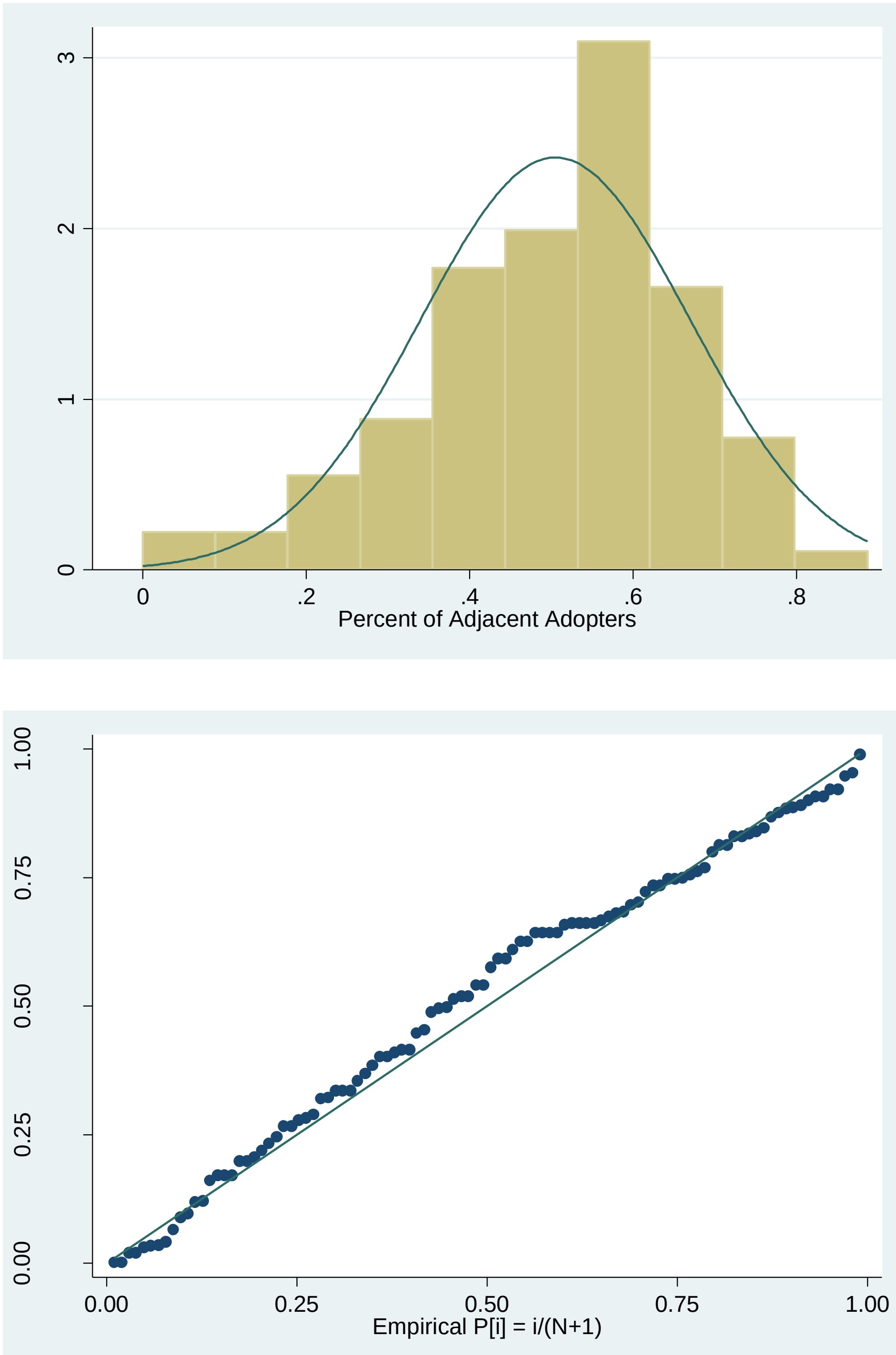


Figure 14: Percentage of Adjacent Adopters Histogram and Probability Plot

Dichotomous covariates

Dichotomous covariates will be tested to ensure that variables do not have a 90-10 split or more.

Enterprise Zone Adoption by County

Counties that have adopted an enterprise zone over the study period were coded 1 and non-adopters were coded 0. Summary statistics revealed the variable meets the 90-10 split requirement. Summary statistics confirmed that 68 counties adopted an enterprise zone over the study period and 34 counties did not.

Table 19: Enterprise Zone Adoption by County Statistics

Enterprise Zone Adoption by County			
	Frequency	Percentage	Cumulative
No (0)	34	33.33	33.33
Yes (1)	68	66.67	100.00
Total	102	100.00	

Regional Diffusion-Propinquity

Regional diffusion was also measured by coding counties with one or more contiguous adopters as 1 and no contiguous adopters as 0. The variable does not meet the 90-10 split requirement when collapsed because all counties but 2 are located adjacent to an adopting county by the end of the study period. Yet, the variable will meet the requirement for Cox regression and in the early adopters logit model and will be included in these models where appropriate.

Table 20: Adjacent Counties Adopted Statistics

Adjacent Counties Adopted			
	Frequency	Percentage	Cumulative
No (0)	2	1.96	1.96
Yes (1)	100	98.04	100.00
Total	102	100.00	

Political/Policy Entrepreneur

This variable measures whether a county is represented by the sponsor of the original enterprise zone legislation. It meets the 90-10 split requirement for the collapsed dataset.

Table 21: Bill Sponsorship Statistics

County Represented by Bill Sponsor			
	Frequency	Percentage	Cumulative
No (0)	87	85.29	85.29
Yes (1)	15	14.71	100.00
Total	102	100.00	

Summary Statistics-Collapsed Data minus Cook County

To ensure Cook County, which contains the City of Chicago, is not skewing the data, Cook County is removed from the analysis and a separate set of summary statistics are compiled to examine the data to determine if this county unduly skews the data.

Population and Population Density-Collapsed Data Minus Cook County

Table 22: County Population Statistics Minus Cook County

County Population (minus Cook County)		
Statistics		
Mean		65192.64
Standard Deviation		115366.2
Confidence Intervals (95%)	42417.9	87967.4
Skewness		3.980633
Kurtosis		21.9238
n =		101

The omission of Cook County reduces both skewness and kurtosis, yet the data remain not normally distributed with a positively skew (3.98) and large peak (21.92). County population density is examined next to determine its distribution and summary statistics. The analysis reveals that population density also exhibits a positive skew and large peak.

Table 23: County Population Density Statistics Minus Cook County

County Population Density (minus Cook County)		
Statistics		
Mean		117.94
Standard Deviation		260.65
Confidence Intervals (95%)	66.5	169.4
Skewness		7.13
Kurtosis		61.93
n =		101

A log transformation of the population variables was undertaken to determine if the population and population density covariates would approach normality.

Table 24: County Population Statistics Transformed Minus Cook County

County Population (minus Cook County)				
Statistics	**Untransformed**		**Transformed (Log)**	
Mean		65192.64		10.33
Standard Deviation		115366.2		1.12
Confidence Intervals (95%)	42417.9	87967.4	10.1	10.6
Skewness		3.980633		0.72
Kurtosis		21.9238		3.17
n =		101		101

The log transformation greatly reduced the skewness to within acceptable limits, but the kurtosis slightly exceeds the +3 threshold. A similar transformation is undertaken for County Population Density.

Table 25: County Population Density Statistics Transformed Minus Cook County

County Population Density (minus Cook County)				
Statistics	**Untransformed**		**Transformed (Log)**	
Mean		117.94		4.13
Standard Deviation		260.65		0.94
Confidence Intervals (95%)	66.5	169.4	3.9	4.3
Skewness		7.13		1.23
Kurtosis		61.93		4.57
n =		101		101

Summary statistics for the log of County Population Density also corrects for skewness but kurtosis slightly exceeds the +3 threshold.

Human Capital

The omission of Cook County from the human capital variables analysis reveals that skewness is within acceptable ranges, but that kurtosis is slightly higher when Cook County is removed.

Table 26: College Graduate Statistics Minus Cook County

Difference in Percentage of College Graduates (minus Cook County)		
Statistics		
Mean		12.38
Standard Deviation		5.64
Confidence Intervals (95%)	11.3	13.5
Skewness		2.05
Kurtosis		7.24
n =		101

A log transformation was also conducted for this variable. The transformation failed to bring the kurtosis measure with the +3 threshold, but did lower it to 3.7.

Table 27: College Graduates Statistics Minus Cook County

Difference in Percentage of College Graduates (minus Cook County)				
Statistics	**Untransformed**		**Transformed (Log)**	
Mean		12.38		2.44
Standard Deviation		5.64		0.37
Confidence Intervals (95%)	11.3	13.5	2.4	2.5
Skewness		2.05		1.05
Kurtosis		7.24		3.86
n =		101		101

Fiscal Capacity

Fiscal capacity variables are also analyzed to determine if they meet the skewness and kurtosis requirements in the absence of Cook County.

Table 28: Property Tax Assessed Value Per Capita Minus Cook County

Property Tax Assessed Value Per Capita (minus Cook County)		
Statistics		
Mean		10351.16
Standard Deviation		5722.46
Confidence Intervals (95%)	9221.5	11480.8
Skewness		3.65
Kurtosis		22.40
n =		101

This data exhibits similar kurtosis challenges. A log transformation reduced kurtosis but failed to bring the kurtosis within acceptable limits.

Table 29: Property Tax Assessed Value Per Capita Transformed Minus Cook County

Property Tax Assessed Value Per Capita (minus Cook County)				
Statistics	**Untransformed**		**Transformed (Log)**	
Mean		10351.16		9.15
Standard Deviation		5722.46		0. .416
Confidence Intervals (95%)	9221.5	11480.8	9.1	9.2
Skewness		3.65		0.69
Kurtosis		22.40		5.17
n =		101		101

Table 30: Sales Tax Revenue Per Capita Minus Cook County

Sales Tax Revenue Per Capita (minus Cook County)		
Statistics		
Mean		69.70
Standard Deviation		23.01
Confidence Intervals (95%)	65.2	74.2
Skewness		0. .44
Kurtosis		3.41
n =		101

Sales tax revenue per capita slightly exceeds the threshold for kurtosis, but the variable will not be transformed as transformation is unlikely to impact the results.

Tests for percentage of nonresidential tax base reveal the variable is normally distributed.

Table 31: Percentage of Non-residential Tax Base Statistics Minus Cook County

Percentage Non-residential Tax Base (minus Cook County)		
Statistics		
Mean		0.55
Standard Deviation		0.14
Confidence Intervals (95%)	0.52	0.58
Skewness		-0.22
Kurtosis		2.42
n =		101

Economic Crisis

Economic crisis data are nearly normally distributed and will not be transformed.

Table 32: Percentage of Unemployment Minus Cook County

Percentage Difference in Unemployment (minus Cook County)		
Statistics		
Mean		0.14
Standard Deviation		0.30
Confidence Intervals (95%)	0.08	0.19
Skewness		0.71
Kurtosis		3.07
n =		101

Conservative political orientation

Conservative political orientation measures were also normally distributed.

Table 33: Difference in Presidential Support for Republicans Minus Cook County

Percentage Difference in Presidential Support for Republicans (minus Cook County)		
Statistics		
Mean		0.07
Standard Deviation		0.06
Confidence Intervals (95%)	0.06	0.08
Skewness		-0.03
Kurtosis		2.43
n =		101

Regional Diffusion

Regional diffusion measure is nearly normally distributed with a slightly high level of kurtosis. The variable will not be transformed for analysis.

Table 34: Percentage of Adjacent Adopters Minus Cook County

Percentage of Adjacent Adopters (Minus Cook County)		
Statistics		
Mean		0.51
Standard Deviation		0.17
Confidence Intervals (95%)	0.47	0.53
Skewness		-.067
Kurtosis		3.59
n =		101

Dichotomous covariates

The omission of Cook County from the analysis will not substantively change the dichotomous covariates and variables to be included in the analysis meet the 90-10 split requirement.

Cook County Omission Summary

The omission of Cook County did not substantially influence the distribution of most of the variables. However, logit and Cox regression models will also be utilized with Cook County removed from the analysis to determine if this omission influences the findings.

Bivariate Analysis

This section contains a detailed bivariate analysis to determine the relationship between the dichotomous dependent variable (adoption of an enterprise zone) and independent variables. To assess the degree of relationship between the dichotomous dependent variable (adopter or non-adopter) and continuous independent variables, Pearsonion correlation will be used. An accompanying t-test will be performed to determine if a significant difference exists between adopters and non-adopters of enterprise zones. To assess the relationship between dichotomous dependent and dichotomous independent variables, a Pearson's chi-square test with Fisher's exact test will be utilized. Fisher's exact test is appropriate because the tables under examination are 2 by 2 (Garson, n.d.). The bivariate analysis includes a correlation matrix to examine the relationships between the continuous variables in the analysis. Because interpretation of transformed variables is difficult, transformed variables are not included in the bivariate analysis. The correlation matrix will also serve as an initial check for multicollinearity between the variables to be used in later regression analyses. Both population and population density are included in the correlation matrix, but only one variable will be used in the regression and multicollinearity between these variables is expected.

The correlation matrix does reveal potential multicollinearity problems percentage of college graduates and several variables in the analysis. While these correlations fail to reach the 0.8 threshold typically considered to indicate multicollinearity problems, additional multicollinearity analysis will be conducted to determine if the relationships between these variables influences regression results.

Table 35: Correlation Matrix

	Pop.	Pop Den	% Coll.	Prop. Tax Per Capita	Sales Per Cap.	% Non-res. Tax Base.	Unemp	Vote Diff. for GOP	% Adj. Adopt
Pop.	1								
Pop Den	0.964*	1							
% Coll.	0.303*	0.394*	1						
Prop. Tax Per Capita	0.114	0.1564	0.235+	1					
Sales Per Cap.	0.196+	0.2869**	0.518*	0.206+	1				
% Non-res. Tax Base	-0.133	-0.209+	-0.55*	0.114	-0.528*	1			
Unemp.	-0.096	-0.130	-0.61*	-0.331*	-0.329*	0.288*	1		
Vote Diff. for GOP	-0.23+	-0.174+	-0.016	0.344*	0.116	-0.003	-0.406*	1	
% Adj. Adopt	-0.084	-0.062	-0.028	0.197+	0.179^	0.008	-0.120	0.171^	1

^ significant at 0.10, +significant at 0.05, and *significant at 0.01.

Pearsonian Correlation (t-tests)

Internal: Demographics

H1: Counties that have a smaller population are more likely to adopt an enterprise zone.

A t-test was used for both population and population density comparing adopters to non-adopters. First, a t-test examining the difference in population mean for adopters and non-adopters was conducted. The results were not significant. Due to unequal variances, a t-test with unequal variances was also conducted with similar not significant results.

Table 36: T-test Population

T-test: Difference in Population				
Adopt Enterprise Zone	N	Mean	Std. Error	Std. Deviation
No (0)	34	62,834.94	28,021.79	163,393.7
Yes (1)	68	142,622.00	76,877.47	633,947.8
Difference = mean (0) – mean (1); $H_o = 0$				
$H_a < 0 = 0.2365$ (one-sided)				
$H_a = 0 = 0.4730$ (two-sided)				
$H_a > 0 = 0.7635$ (one-sided)				

The presence of outliers required the population variable be transformed. A log of population t-test revealed that a significant difference in population does exist between the adopters and non-adopters. Contrary to the research hypothesis that smaller counties are more likely to adopt, the t-test reveals the mean population of adopters is larger than the mean population of non-adopters. Therefore, this hypothesis was not supported by the bivariate analysis.

Table 37: T-test, Population (log of)

T-test: Difference in Population (log of)				
Adopt Enterprise Zone	N	Mean	Std. Error	Std. Deviation
No (0)	34	9.89	0.21	1.20
Yes (1)	68	10.63	0.14	1.16
Difference = mean (0) – mean (1); $H_o = 0$				
$H_a < 0 = 0.0016$ (one-sided)				
$H_a = 0 = 0.0031$ (two-sided)				
$H_a > 0 = 0.9984$ (one-sided)				

The results for a difference in mean for population density were not significant.

Table 38: T-test Population Density

T-test: Difference in Population Density				
Adopt Enterprise Zone	N	Mean	Std. Error	Std. Deviation
No (0)	34	134.30	71.27	415.59
Yes (1)	68	189.67	81.50	672.07
Difference = mean (0) – mean (1); $H_o = 0$				
$H_a < 0$ = 0.3306 (one-sided)				
$H_a = 0$ = 0.6612 (two-sided)				
$H_a > 0$ = 0.6694 (one-sided)				

The presence of outliers required the population density variable be transformed. A log of population density t-test revealed that a significant difference in population density does exist between the adopters and non-adopters. Contrary to the research hypothesis that smaller counties are more likely to adopt, the t-test reveals the mean population density of adopters is larger than the mean population of non-adopters. Therefore, this hypothesis was not supported by the bivariate analysis.

Table 39: T-test Population Density (log of)

T-test: Difference in Population Density (log of)				
Adopt Enterprise Zone	N	Mean	Std. Error	Std. Deviation
No (0)	34	3.82	0.18	1.07
Yes (1)	68	4.35	.012	0.98
Difference = mean (0) – mean (1); $H_o = 0$				
$H_a < 0 = 0.0074$ (one-sided)				
$H_a = 0 = 0.0148$ (two-sided)				
$H_a > 0 = 0.9926$ (one-sided)				

Internal: Economic

H2: Counties that have greater human capital are more likely to pursue demand-side policies and are therefore less likely to adopt an enterprise zone.

A t-test comparing the mean percentage of college graduates was not significant. Therefore, this hypothesis was not supported by the bivariate analysis.

Table 40: T-test College Graduates

T-test: Difference in Percentage of College Graduates				
Adopt Enterprise Zone	N	Mean	Std. Error	Std. Deviation
No (0)	34	12.12	1.09	6.33
Yes (1)	68	12.6	0.65	5.37
Difference = mean (0) – mean (1); $H_o = 0$				
$H_a < 0 = 0.3348$ (one-sided)				
$H_a = 0 = 0.6697$ (two-sided)				
$H_a > 0 = 0.6652$ (one-sided)				

H3: Counties that have greater fiscal capacity (i.e. slack resources) have more economic development options and are therefore less likely to adopt an enterprise zone.

This hypothesis was examined through three variables: a) equalized assessed value of annualized property tax revenue per capita, b) sales tax per capita, and c) percentage of property tax base that is non-residential. Each is examined here through t-tests.

The initial t-test for property tax revenue per capita supports the hypothesis. The t-test demonstrates at the .10 significance level that the mean property tax revenue per capita for non-adopters is significantly higher than for adopters.

Table 41: T-test Property Tax Revenue

T-test: Difference in Property Tax Revenue Per Capita				
Adopt Enterprise Zone	N	Mean	Std. Error	Std. Deviation
No (0)	34	11,665.79	1320.42	7699.31
Yes (1)	68	9,741.97	522.78	4310.95
Difference = mean (0) – mean (1); $H_o = 0$				
$H_a < 0 = 0.9457$ (one-sided)				
$H_a = 0 = 0.1086$ (two-sided)				
$H_a > 0 = 0.0543$ (one-sided)				

The presence of outliers required this variable be transformed. A log of property tax revenue per capita t-test supported the hypothesis.

Table 42: T-test Property Tax Revenue (log of)

T-test: Difference in Property Tax Revenue Per Capita (log of)				
Adopt Enterprise Zone	N	Mean	Std. Error	Std. Deviation
No (0)	34	9.23	0.08	0.48
Yes (1)	68	9.11	0.05	0.37
Difference = mean (0) – mean (1); $H_o = 0$				
$H_a < 0 = 0.9230$ (one-sided)				
$H_a = 0 = 0.1541$ (two-sided)				
$H_a > 0 = 0.0770$ (one-sided)				

The t-test for sales tax per capita fails to supports the hypothesis. Contrary to the hypothesis, the t-test demonstrates at the .005 significance level that the mean sales tax per capita for adopters is significantly higher than for non-adopters.

Table 43: T-test Sales Tax Per Capita

T-test: Difference in Sales Tax Per Capita				
Adopt Enterprise Zone	N	Mean	Std. Error	Std. Deviation
No (0)	34	59.41	4.25	24.80
Yes (1)	68	75.11	2.45	20.21
Difference = mean (0) – mean (1); $H_o = 0$				
$H_a < 0$ = 0.0004 (one-sided)				
$H_a = 0$ = 0.0009 (two-sided)				
$H_a > 0$ = 0.9996 (one-sided)				

The t-test for percentage of non-residential tax base also supports the hypothesis at the .10 level. The t-test demonstrates that the mean percentage of non-residential tax base for adopters is significantly lower than for non-adopters.

Table 44: T-test Non-Residential Tax Base

T-test: Difference in Percentage of Non-Residential Tax Base				
Adopt Enterprise Zone	N	Mean	Std. Error	Std. Deviation
No (0)	34	0.58	0.03	0.16
Yes (1)	68	0.54	0.02	0.13
Difference = mean (0) – mean (1); $H_o = 0$				
$H_a < 0$ = 0.9135 (one-sided)				
$H_a = 0$ = 0.1730 (two-sided)				
$H_a > 0$ = 0.0865 (one-sided)				

H4: Counties that suffer from more severe economic crises will be more likely rely on supply-side policies and are more likely to adopt an enterprise zone.

Economic crisis was measured as the percentage difference in annual unemployment rate from the state average. The t-test did not reveal a statistically significant difference between adopters and non-adopters.

Table 45: T-test Unemployment

T-test: Difference in Percentage of Unemployment Difference from State Average				
Adopt Enterprise Zone	N	Mean	Std. Error	Std. Deviation
No (0)	34	0.09	0.05	0.30
Yes (1)	68	0.16	0.04	0.30
Difference = mean (0) – mean (1); $H_o = 0$				
$H_a < 0 = 0.1400$ (one-sided)				
$H_a = 0 = 0.2801$ (two-sided)				
$H_a > 0 = 0.8600$ (one-sided)				

Internal: Political and Policy Entrepreneur

H5: Counties with a more conservative political orientation are more likely to support supply side policies and are therefore more likely to adopt an enterprise zone.

Political orientation was measured as a deviation from the statewide vote for Republicans in two-party vote in an average of most recent presidential elections measured as county percentage vote Republican minus state average vote Republican. Contrary to the hypothesis, the t-test reveals that the percentage deviation for adopters is statistically significantly lower than for non-adopters, which suggests that counties voting for Republicans at a lower percentage are more likely to adopt. However, the effect size is small and the numbers represent an average over the study period.

Table 46: T-test Republican Presidential Vote Difference

T-test: Deviation from statewide vote for Republicans in two-party vote in presidential elections.				
Adopt Enterprise Zone	N	Mean	Std. Error	Std. Deviation
No (0)	34	0.08	0.01	0.07
Yes (1)	68	0.06	0.01	0.06
Difference = mean (0) – mean (1); $H_o = 0$				
$H_a < 0 = 0.9511$ (one-sided)				
$H_a = 0 = 0.0979$ (two-sided)				
$H_a > 0 = 0.0489$ (one-sided)				

Chi-square/Fisher's Exact Test

Internal: Political and Policy Entrepreneur

H6: Counties represented or partially represented by primary sponsors of enterprise zone legislation are more likely to adopt an enterprise zone.

Fisher's exact test was utilized to examine the collapsed data to determine if the observation of the observed table significantly differed from chance.

Table 47: Fisher's Exact Test Bill Sponsorship

Adopters of Enterprise Zone	**Represented by Bill Sponsor**		**Total**
	No (0)	Yes (1)	
No (0)	32 (94.12%)	2 (5.88%)	34
Yes (1)	55 (80.88%)	13 (19.12%)	68
Total	**87 (85.29%)**	**15 (14.71%)**	**102**
Pearson's chi2 = 3.1655, Pr. = 0.075			
one-sided Fisher's exact test = 0.064			

This analysis reveals that there is a significant difference from chance from the observed table at the 0.10 probability level. Nineteen percent of adopters of an enterprise zone were represented by a sponsor of the original enterprise zone legislation, which suggestions that policy entrepreneurship and political variables influence adoption. Fifteen counties were represented by an original bill sponsor, of which 13 counties (86.6% adopted an enterprise zone).

Logit Modeling

This section describes five broad logit models utilized to examine the relationships between enterprise zone adoption and predictor variables. First, a series of logit models were utilized to exam the impact of each predictor variable on enterprise zone adoption using a collapsed dataset (i.e. average for each variable over the entire study period). Several phases of modeling were conducted. The first set of models described here utilized logit to separately model the relationship between enterprise zone adoption and each variable or grouping of variables associated with the hypotheses. These individual models help to further understand the relationship between each predictor variable(s) and adoption in the absence of other factors. Next, the predictor variables were included in one logit model to determine the effect of each predictor when other variables were included in the model. The final logit model is parsimonious and utilizes information gathered from the individual and grouped variable modeling exclude non-significant variables where theoretically justifiable.

The second set of modeling utilized collapsed dataset and executed the same series of modeling; however, this analysis excluded Cook County (City of Chicago) from the analysis to determine if the presence of such a large county influenced the study findings.

The final three logit models utilize a similar approach to examine the factors influencing early, middle, and late enterprise zone adoption. In each "round" of analysis, those previously adopting an enterprise zone are excluded. For example, the analysis of late adopters would exclude early and middle adopters. As described previously, natural breaks in the data are used to classify counties into early, middle, late, or never adopter categories. Modeling the covariates or predictors at each phase of the adoption process helps the researcher gain a better understanding of how the importance of predictors change throughout the innovation process. Also, additional variables such as percentage of adjacent adopters, which could not be modeled in the collapsed analysis due to the large number of existing adopters, are available for use at each phase. Other variables, such as representation by bill sponsor "fall out" of the analysis as middle and late adopters are not represented by bill sponsors with a large enough percentage to be included in statistical analysis.

Logit Modeling-Collapsed Dataset

Logit models 1 and 2 examine the relationship between demographic variables population and population density and enterprise zone adoption. Neither models finds demographic characteristics to be significantly related to adoption.

Logit models 3, 4, and 5 examine the relationship between economic variables. Models 3 and 5 examine the relationship between percentage of college graduates (model 3) and enterprise zone adoption and relationship between difference in unemployment rate from state average (model 5) and enterprise zone adoption. Neither variable is significant modeled individually. Model 4 examines fiscal capacity in the form of property tax revenue per capita, sales tax per capita, and percentage of non-residential property tax base. As expected, property tax base per capita is slightly negatively associated with enterprise zone adoption while sales tax per capita is unexpectedly positively associated with enterprise zone adoption. Non-residential property tax base is non-significant. The pseudo r-squared for this model is 0.1487.

Logit models 6 and 7 examine political effects. Contrary to the expected direction, a decline in the percentage difference in two-party vote for Republicans from the state average is positively associated with enterprise zone adoption. As expected, representation by a bill sponsor is also positively associated with enterprise zone adoption. Both variables are significant, but the pseudo r-squared for the models are low.

Model 8 examines regional effects in the form of percentage of adjacent adopters. The percentage of adjacent adopters appears to have no effect on enterprise zone adoption.

Table 48: Logit Models of Individual and Variable Groupings (n = 102)

Var. Coef. (P> |z|)	Model 1: Demog: Pop	Model 2: Demog: Population Density	Model 3: Econ: % College Graduates	Model 4: Econ: Property Tax Per Capita, Sales Tax Per Capita, % Non-Res. Tax Base	Model 5: Econ: Unemp Rate	Model 6: Pol: GOP Vote Diff.	Model 7: Pol: Bill Sponsorship	Model 8: Reg: % of Adj. Adopt
Pop.	6.31e-07 (0.582)							
Pop Den		0.0001 (0.667)						
% College Grad			0.02 (0.67)					
Prop. Tax Per Capita				-0.0001 (0.017)				
Sales Tax Per Capita				0.052 (0.000)				
% Non-res. tax Base				2.38 (0.225)				
Unemp Rate					0.79 (0.279)			
GOP Vote						-5.38 (0.100)		
Bill Sponsor.							1.33 (0.093)	
% of Adj. Adopter								1.24 (0.331)
Prob >Chi2	0.3819	0.6383	0.6624	0.0002	0.2695	0.0933	0.0573	0.3304
Pseudo R2	0.0059	0.0017	0.0015	0.1487	0.0094	0.0217	0.0278	0.0073

Logit Model 9 demonstrates that sales tax per capita is positively associated with enterprise zone adoption. The model yields a modest amount of explanatory power with a pseudo r-squared of 0.19.

Table 49: Logit Model 9-All Factors Collapsed Dataset

	Coef.	Std. Err.	z	P>z	95% Conf Interval	
Population	-1.01E-07	7.29E-07	-0.14	0.890	-1.53E-06	1.33E-06
% College Graduates	-0.04596	0.0745	-0.62	0.537	-0.19197	0.100059
Property Tax Per Capita	-7.4E-05	5.46E-05	-1.36	0.174	-0.00018	3.29E-05
Sales Tax Per Capita	0.055212	0.016489	3.35	0.001	0.022894	0.087529
% Non-residential tax Base	0.832335	2.269873	0.37	0.714	-3.61653	5.281204
Unemploy. Rate	0.670868	1.28005	0.52	0.600	-1.83798	3.17972
GOP Vote	-5.65829	4.89766	-1.16	0.248	-15.2575	3.940946
Bill Sponsor.	0.8727	0.977078	0.89	0.372	-1.04234	2.787737
% of Adjacent Adopters	0.784935	1.58344	0.5	0.620	-2.31855	3.888421
_cons	-2.25782	2.382494	-0.95	0.343	-6.92742	2.41178

Number of obs	102
LR chi2(9)	24.97
Prob > chi2	0.003
Pseudo R2	0.1923
Log likelihood	-52.437044

To check for multicollinearity, an uncentered variance inflation factor (VIF) test was run on the logit model. In most cases, the presence of a VIF greater than 10 for individual variables is a sign of multicollinearity. Some estimates place the value at greater than 30. If the mean of all VIFs is greater than 1, then this also signals multicollinearity problems with the model. Logit Model 9 reveals modest levels of multicollinearity among the predictor variables. Population has a modest VIF of 14.68

and three other variables have VIFs slightly exceed 10. Additionally, the mean VIF is 6.92, which greatly exceeds the mean of 1.

Table 50: Variance Inflation Factor

Variable	VIF	1/VIF
Sales Tax Per Capita	14.68	0.068119
% of Adjacent Adopters	11.23	0.089031
% College Graduates	10.86	0.092067
% Non-residential tax Base	10.62	0.094162
Property Tax Per Capita	6.37	0.157035
GOP Vote	3.22	0.310926
Unemploy. Rate	2.32	0.430367
Bill Sponsor.	1.51	0.663906
Population	1.43	0.697605
Mean VIF	6.92	

It should be noted that multicollinearity is primarily a problem for causal modeling, but is less of a problem for basic prediction because the predicted values are fairly constant, although assessing relative importance of the predictors is problematic (Garson, n.d.). The initial logit model examined here demonstrates modest predictive power and illustrates some of the core predictors are statistically significant in predicting enterprise zone adoption. Multicollinearity limits the determination of the relative effect of each predictor. Therefore, an attempt to trim the model and reduce multicollinearity will be pursued as additional models are developed. The researcher explored dropping the percentage of college graduates from the analysis which slightly improved the VIF, but made little improvements to model fit.

Next, logit was utilized to examine the influence of the predictors in the absence of Cook County, home of the City of Chicago. Chicago is large population center and a major outlier variable. Prior to the analysis, a correlation matrix was examined to determine if significant changes exist among the variables in Cook County's absence. Again, population density is included in the correlation matrix, but is not expected to be utilized in the multivariate analysis.

The correlation matrix reveals no major concerns for multicollinearity based on the correlations between continuous independent variables in the model.

Table 51: Correlation Matrix Minus Cook County

	Pop.	Pop Den	% Coll.	Prop. Tax Per Capita	Sales Per Cap.	% Non-res. Tax Base.	Unemp	Vote Diff. for GOP	% Adj. Adopt
Pop.	1								
Pop Den	0.899*	1							
% Coll.	0.693*	0.588*	1						
Prop. Tax Per Capita	0.271*	0.2426+	0.2247+	1					
Sales Per Cap.	0.554*	0.5005*	0.5139*	0.2031+	1				
% Non-res. Tax Base	-0.61*	-0.479*	-0.567*	0.1143	-0.530*	1			
Unemp.	-0.32*	-0.245+	-0.617*	-0.331*	-0.328*	0.288*	1		
Vote Diff. for GOP	0.057	0.1201	0.0241	0.3712*	0.1407	-0.004	-0.427*	1	
% Adj. Adopt	0.040	0.0552	-0.0137	0.2036+	0.1807^	0.008	-0.113	0.153	1
^ significant at 0.10, +significant at 0.05, and *significant at 0.01.									

Logit Model 10 explores the relationship between adoption and the predictors in the absence of Cook County (Chicago). The findings are more consistent with theory and relevant hypotheses than the model including Cook County. Population is negatively associated with adoption, which indicates that smaller counties are more likely to adopt. As with the Cook County model, sales tax per capita is positively associated with enterprise zone adoption. The model yields a modest amount of explanatory power with a pseudo r-squared of 0.21.

Table 52: Logit Model 10-All Factors Collapsed Dataset Minus Cook County

	Coef.	Std. Err.	z	P>z	95% Conf Interval	
Population	-5.80E-06	3.45E-06	-1.68	0.093	-1.3E-05	9.65E-07
% College Graduates	0.017005	0.087229	0.19	0.845	-0.15396	0.18797
Property Tax Per Capita	-5.1E-05	5.28E-05	-0.96	0.338	-0.00015	5.29E-05
Sales Tax Per Capita	0.061884	0.017409	3.55	0.000	0.027764	0.096005
% Non-residential tax Base	-0.57888	2.394113	-0.24	0.809	-5.27125	4.113497
Unemploy. Rate	1.270907	1.351694	0.94	0.347	-1.37837	3.920179
GOP Vote	-5.30578	4.793021	-1.11	0.268	-14.6999	4.088372
Bill Sponsor.	1.077505	1.001529	1.08	0.282	-0.88546	3.040466
% of Adjacent Adopters	0.611686	1.624108	0.38	0.706	-2.57151	3.79488
_cons	-2.58839	2.348924	-1.1	0.270	-7.1922	2.015418

Number of obs	101
LR chi2(9)	27.1
Prob > chi2	0.0013
Pseudo R2	0.21
Log likelihood	-50.965449

To check for multicollinearity, an uncentered variance inflation factor (VIF) test was run on the logit model. In most cases, the presence of a VIF greater than 10 for individual variables is a sign of multicollinearity. Some estimates place the value at greater than 30. If the mean of all VIFs is greater than 1, then this also signals multicollinearity problems with the model. Logit Model 2 reveals modest levels of multicollinearity among the predictor variables. Percentage of non-residential tax base has a modest VIF of 16.4 and three other variables have VIFs slightly exceed 10. Additionally, the mean VIF is 8.27, which greatly exceeds the mean of 1.

Table 53: Variance Inflation Factor

Variable	VIF	1/VIF
% Non-residential tax Base	16.40	0.060974
Sales Tax Per Capita	14.78	0.067676
% College Graduates	14.52	0.068875
% of Adjacent Adopters	11.18	0.089407
Property Tax Per Capita	6.85	0.145904
Population	3.58	0.279032
GOP Vote	3.20	0.312265
Unemploy. Rate	2.49	0.401077
Bill Sponsor.	1.41	0.711263
Mean VIF	8.27	

Logit model 11 explores the influence of each predictor on during the early stage of adoption. This analysis collapses the data and takes an average for each variable over the period 1983 to 1985 where 25 counties (36.8% of total adopters) adopted an enterprise zone for the first time.

Table 54: Logit Model 11-Early Adopters

	Coef.	Std. Err.	z	P>z	95% Conf Interval	
Population	2.92E-06	4.19E-06	0.70	0.485	-5.29E-06	1.11E-05
% College Graduates	-0.01944	0.08367	-0.23	0.816	-0.18343	0.144548
Property Tax Per Capita	-2.2E-05	0.000116	-0.19	0.848	-0.00025	0.000205
Sales Tax Per Capita	0.00068	0.014425	0.05	0.962	-0.02759	0.028953
% Non-residential tax Base	-5.40033	3.077062	-1.76	0.079	-11.4313	0.630601
Unemploy. Rate	-0.47948	1.245176	-0.39	0.700	-2.91998	1.961023
GOP Vote	-6.83995	5.348704	-1.28	0.201	-17.3232	3.643315
Bill Sponsor.	0.731097	0.808977	0.9	0.366	-0.85447	2.316662
% of Adjacent Adopters	0.377008	2.25469	0.17	0.867	-4.0421	4.79612
_cons	2.547582	2.656892	0.96	0.338	-2.65983	7.754996

Number of obs	102
LR chi2(9)	22.32
Prob > chi2	0.0079
Pseudo R2	0.1964
Log likelihood	-45.643989

Logit Model 11 demonstrates that the percentage of non-residential tax base is negatively associated with enterprise zone adoption in the early stage. The model yields a modest amount of explanatory power with a pseudo r-squared of 0.19.

Table 55: Variance Inflation Factor

Variable	VIF	1/VIF
% Non-residential tax Base	13.66	0.073186
Sales Tax Per Capita	11.78	0.084868
Property Tax Per Capita	9.22	0.108488
% College Graduates	8.18	0.122314
% of Adjacent Adopters	3.15	0.317214
GOP Vote	3.01	0.331899
Unemploy. Rate	2.8	0.356754
Bill Sponsor.	1.43	0.69907
Population	1.34	0.743501
Mean VIF	6.06	

The VIFs ranges are generally acceptable. Two covariates exceed the 10 threshold, but the mean VIF is 6.06, which exceeds the desired mean of 1.

Logit model 12 excludes the early adopters and examines those counties adopting in the "middle" stages of the adoption period. The model finds that none of the predictor variables are significant during this stage of adoption using a collapsed logit model.

Table 56: Logit Model 12-Middle Adopters

	Coef.	Std. Err.	z	P>z	95% Conf Interval	
Population	-3.42E-06	6.63E-06	-0.52	0.606	-1.6E-05	9.57E-06
% College Graduates	-0.04994	0.105375	-0.47	0.636	-0.25647	0.156592
Property Tax Per Capita	-2.5E-05	0.000038	-0.66	0.510	-1E-04	4.94E-05
Sales Tax Per Capita	0.013607	0.013513	1.01	0.314	-0.01288	0.040093
% Non-residential Tax Base	1.400276	2.52621	0.55	0.579	-3.55101	6.351557
Unemploy. Rate	0.35385	0.707599	0.5	0.617	-1.03302	1.740717
GOP Vote	1.394355	3.992689	0.35	0.727	-6.43117	9.219881
% of Adjacent Adopters	1.742616	1.436286	1.21	0.225	-1.07245	4.557684
_cons	-2.45481	2.323958	-1.06	0.291	-7.00968	2.100065

Number of obs	76
LR chi2(9)	5.27
Prob > chi2	0.7287
Pseudo R2	0.0539
Log likelihood	-46.19

The VIFs ranges are generally acceptable. Three covariates exceed the 10 threshold, but the mean VIF is 6.75, which exceeds the desired mean of 1.

Table 57: Variance Inflation Factor

Variable	VIF	1/VIF
% Non-residential Tax Base	15.04	0.066472
% College Graduates	11.24	0.088957
Sales Tax Per Capita	10.94	0.091375
% of Adjacent Adopters	5.98	0.167144
Property Tax Per Capita	3.18	0.314655
Unemploy. Rate	2.79	0.358859
Population	2.78	0.359932
GOP Vote	2.03	0.492954
Mean VIF	6.75	

Logit model 13 excludes the early and middle adopters and examines those counties adopting in the "late" stages of the adoption period. The model finds that none of the predictor variables are significant during this stage of adoption using a collapsed logit model.

Table 58: Logit Model 13-Late Adopters

	Coef.	Std. Err.	z	P>z	95% Conf Interval	
Population	0.000049	3.69E-05	1.33	0.184	-2.3E-05	0.000121
% College Graduates	-0.53135	0.588447	-0.90	0.367	-1.68468	0.621985
Property Tax Per Capita	0.000181	0.000505	0.36	0.719	-0.00081	0.001171
Sales Tax Per Capita	-0.13338	0.102539	-1.30	0.193	-0.33435	0.067598
% Non-residential Tax Base	-7.97923	15.43504	-0.52	0.605	-38.2314	22.27289
Unemploy. Rate	3.765653	4.096233	0.92	0.358	-4.26282	11.79412
GOP Vote	-28.2808	26.38797	-1.07	0.284	-80.0003	23.43864
% of Adjacent Adopters	3.601395	7.056171	0.51	0.610	-10.2285	17.43124
_cons	1.801069	2.655898	0.68	0.498	-3.4044	7.006535

Number of obs	53
LR chi2(9)	7.46
Prob > chi2	0.4881
Pseudo R2	0.1098
Log likelihood	-30.2327

Table 59: Variance Inflation Factor

Variable	VIF	1/VIF
% Non-residential Tax Base	13.54	0.073844
% College Graduates	12.91	0.077433
Sales Tax Per Capita	12.32	0.08117
Property Tax Per Capita	9.85	0.101496
% of Adjacent Adopters	8.98	0.111307
Population	4.7	0.212626
GOP Vote	1.98	0.505721
Unemploy. Rate	1.91	0.523521
Mean VIF	8.28	

The VIFs ranges are generally acceptable. Three covariates exceed the 10 threshold, but the mean VIF is 8.28, which exceeds the desired mean of 1.

Logit Modeling Summary

Taking an average for each predictor variable over the 23-year study period allowed for a preliminary examination of the relationships among the independent variable and dependent variables. Logit Model 9 examined the relationship between the average for each predictor variable and enterprise zone adoption. The model, which yielded a modest pseudo r-squared of 0.19, found sales tax per capita was positively related to enterprise zone adoption. None of the other predictors were significant. Logit Model 10 dropped Cook County (City of Chicago) from the analysis. The model found population (minus Cook County) was negatively related to enterprise zone adoption as hypothesized. Sales tax per capita remained significant in this model. Logit models 11, 12, and 13, respectively, examined predictors influence on adoption in the early, middle, and late adoption stages. In each model, the average for the predictors was calculated for the early, middle, and late time periods. In the middle time period, the early adopters were excluded from the analysis and both early and middle adopters were excluded from the late adopter analysis. The early model found the percentage of non-residential tax base was negatively associated with enterprise zone adoption. Predictors were not significant in the middle and late adopter models.

The logit analysis on the collapsed variables is an appropriate step in understanding the relationship between each predictor variable and enterprise zone adoption. Yet, much change may have occurred in each county over the 23-year study period and utilizing an average over such a period fails to capture or understates demographic, economic, and political changes occurring in each county over the study period. As previously discussed, event history analysis is the preferred method for examining policy diffusion. The next sections of the methods chapter utilized Cox regression to examine the relationship between enterprise zone adoption and the predictor variables.

VI: Cox Model Building

This chapter utilizes Cox regression to examine the relationship between enterprise zone adoption and the predictor variables or covariates identified for each hypothesis. The chapter contains Cox model building and hypothesis testing. As discussed in the previous modeling building chapter, the data generally meet the necessary assumptions for regression analysis, including Cox regression. However, a few additional tests specifically designed for survival analysis will be examined as part of the model building.

Cox Model

The stset function in STATA was used to establish the data in a survival-time data format, which is the first step in conducting survival analysis in STATA. Next, a correlation matrix for continuous variables was executed as a check to ensure no multicollinearity exists within the survival data. A correlation of 0.8 would indicate potential multicollinearity problems for a regression analysis. The largest correlation is 0.6 between difference in percentage of college graduates and unemployment. College graduates may be dropped from the future regression analysis if problems appear.

Table 60: Correlation Matrix for Survival Data

	Pop.	Pop Den	% Coll.	Prop. Tax Per Capita	Sales Per Cap.	% Non-res. Tax Base.	Unemp.	Vote Diff. for GOP	% Adj. Adopt
Pop.	1								
Pop Den	0.964*	1							
% Coll.	0.290*	0.377*	1						
Prop. Tax Per Capita	0.109*	0.150*	0.232*	1.0000					
Sales Per Cap.	0.183*	0.268*	0.505*	0.230*	1				
% Non-res. Tax Base	-0.124*	-0.195*	-0.564*	0.103*	-0.488*	1			
Unemp.	-0.075*	-0.102*	-0.508*	-0.237*	-0.266*	0.263*	1		
Vote Diff. for GOP	-0.202*	-0.153*	0.030	0.317*	0.120*	-0.043+	-0.344*	1	
% Adj. Adopt	-0.041*	-0.028	0.127*	0.033	0.110*	-0.198*	-0.164*	0.054*	1
+significant at 0.05, and *significant at 0.01.									

Next the stcox function was used to conduct a Cox regression on the predictor variables. The Breslow method for ties in failure rates, which is the default in STATA, was selected. While additional methods for addressing ties are available, researchers have concluded that the method for handling ties rarely results in changes to substantive results (Garson, n.d.). The Schoenfeld residual option was also selected at the time Cox was specified to aid in later testing of proportional hazards assumptions. Both population and population density were used in Cox regressions. No differences were found and the author elected to utilize population density and reports those findings in the analysis.

The initial Cox model finds that Sales Tax Per Capita and Percentage of Non-residential Tax Base are both positive predictors of enterprise zone adoption. Each predictor is a measure of economic well-being of each county. Contrary to diffusion theory, the initial analysis finds that the likelihood of adoption declines as the percentage of adjacent adopters increases for each county. The overall Cox model is also significant.[8]

[8] All Cox regression models presented in the chapter have narrow confidence intervals, especially where the data utilized represent an absolute difference in county and state average for a variable. Though not reported here, several transformations of the variables were utilized to increase the width of confidence intervals. The transformation did not affect the significance of the variables or change the significance of proportional hazards tests. As discussed earlier in the dissertation, untransformed variables are used where significance is not influenced to ease model interpretation. Unemployment and bill sponsorship, the significant variables reported in later models, remained the only significant variables in the model(s).

Table 61: Cox Regression All Variables

	Hazard Ratio	Std. Error	z	P>z	95% Conf Interval	
Population Density	.9999307	.0002008	-0.35	0.730	.999537	1.000324
% College Graduates	.9868581	.0338248	-0.39	0.700	.922740	1.055431
Property Tax Per Capita	.9999702	.0000325	-0.92	0.359	.999906	1.000034
Sales Tax Per Capita	1.013049	.0061859	2.12	0.034	1.00099	1.025246
% Non-residential Tax Base	8.783488	10.78644	1.77	0.077	.791335	97.49295
Unemploy. Rate	1.682817	.5631355	1.56	0.120	.873357	3.242513
GOP Vote	.5037582	.9691956	-0.36	0.722	.011603	21.87129
% of Adjacent Adopters	.097154	.046458	-4.88	0.000	.038056	.2480254
Bill Sponsor	3.372629	1.933689	2.12	0.034	1.09631	10.37536

# of Subjects	2346
# of Failures	68
# of Observation	2346
Times at Risk	4673232
LR chi2(9)	55.81
Prob > chi2	0.0000
Log likelihood	-478.92007

The initial Cox regression was run on the selected covariates without checking the major assumptions of Cox regression. STATA requires that Schoenfeld residuals be specified at the time Cox modeling is conducted. One advantage of Cox regression is that a researcher does not have to specify a baseline hazard rate or specify the relationship between the “hazard” or event of interest occurring (in this case, enterprise zone adoption) and other variables. However, a key assumption in Cox regression is the hazard ratio or proportional relationship between two hazards remains constant overtime. First, the universal test and a test of each variable were conducted using Schoenfeld residuals to determine that the proportional hazards assumption was not violated. A significant chi-square result indicates that proportional hazards have been violated. The percentage of adjacent adopters and the percentage of non-residential tax base are significant at the 0.05 level. Population density, sales tax per capita, property tax per capita, and GOP vote difference are significant at the 0.10 level.

Table 62: Cox Proportional Hazards Test for Schoenfeld Residuals

	Rho	Chi-square	d.f.	Prob> Chi square
Population Density	-0.21665	3.04	1	0.0811
% College Graduates	0.01065	0.01	1	0.9261
Property Tax Per Capita	-0.21427	2.72	1	0.0988
Sales Tax Per Capita	0.21703	2.98	1	0.0844
% Non-residential Tax Base	0.32822	8.73	1	0.0031
Unemploy. Rate	0.05266	0.12	1	0.7241
GOP Vote	-0.22159	3.01	1	0.0830
% of Adjacent Adopters	0.48429	16.26	1	0.0001
Bill Sponsor	0.02453	0.05	1	0.8232
Global Test		38.26	9	0.0000

Schoenfeld residuals may be examined graphically as an additional test of proportional hazards by plotting scaled Schoenfeld residuals on the y axis against time on the x-axis. A lowess smoothing line is used with the goal being a horizontal line close 0. (Garson, n.d.). Graphics created for each variable follow.

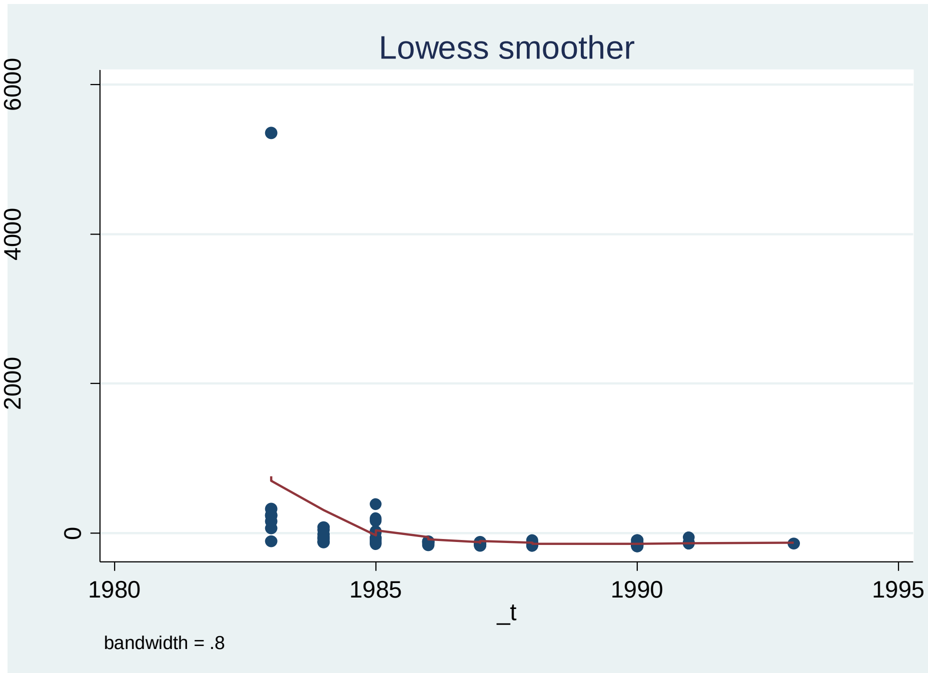


Figure 15: Lowess Graph for Population Density

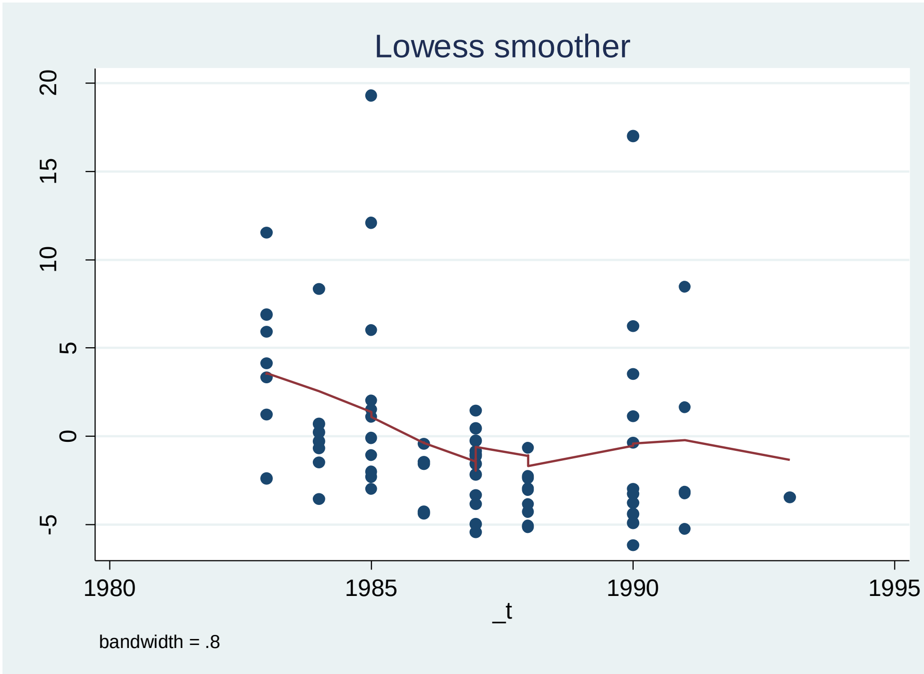


Figure 16: Lowess Graph for College Graduates

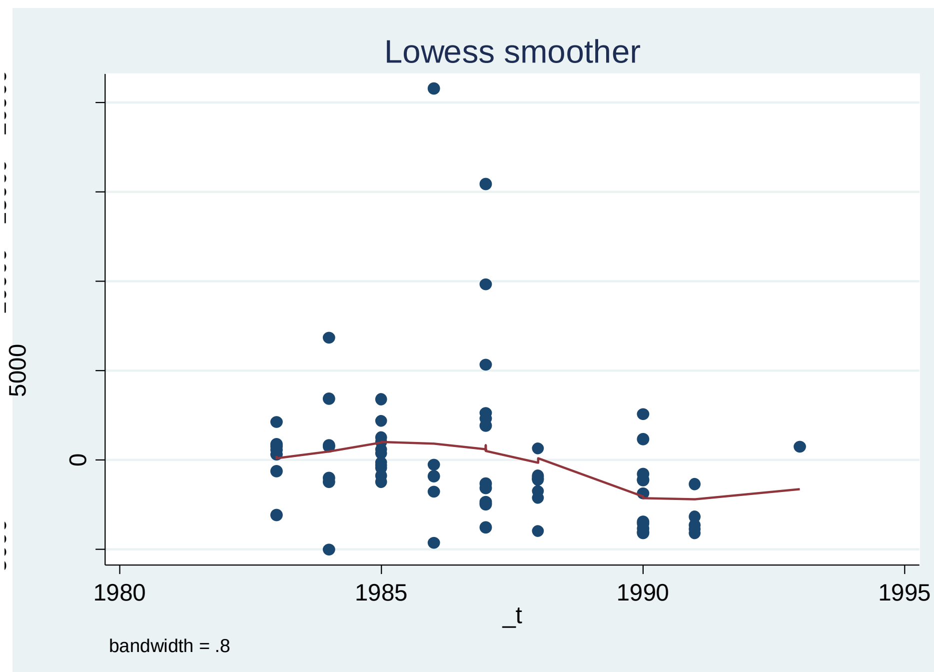


Figure 17: Lowess Graph for Property Tax Per Capita

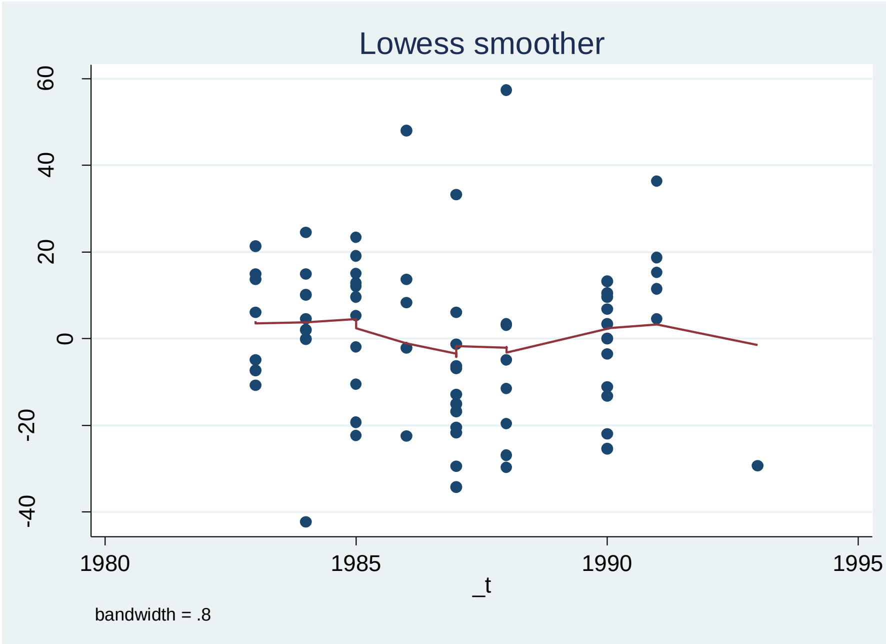


Figure 18: Lowess Graph for Sales Tax Per Capita

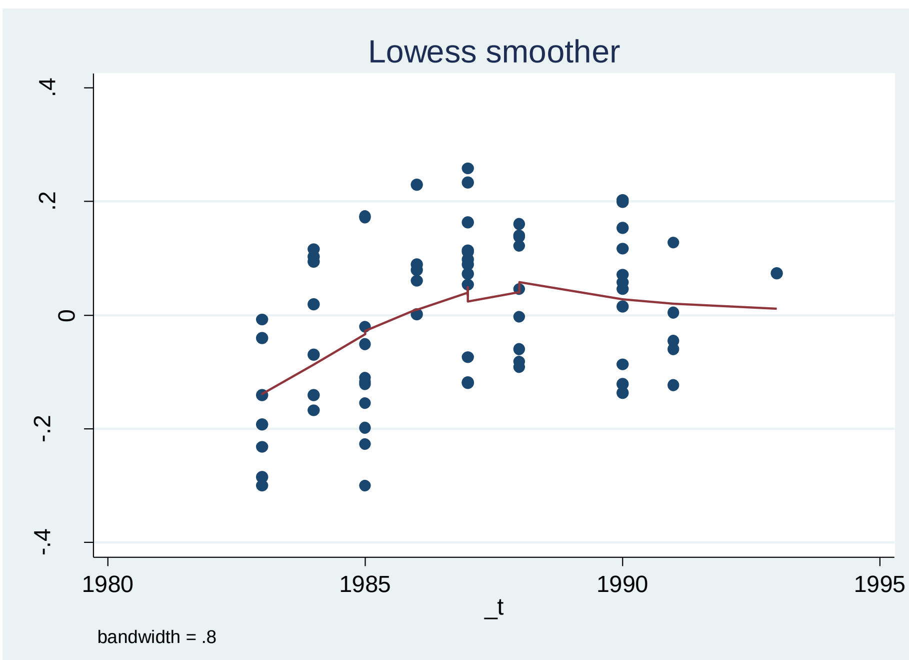


Figure 19: Lowess Graph for Percentage of Non-residential Tax Base

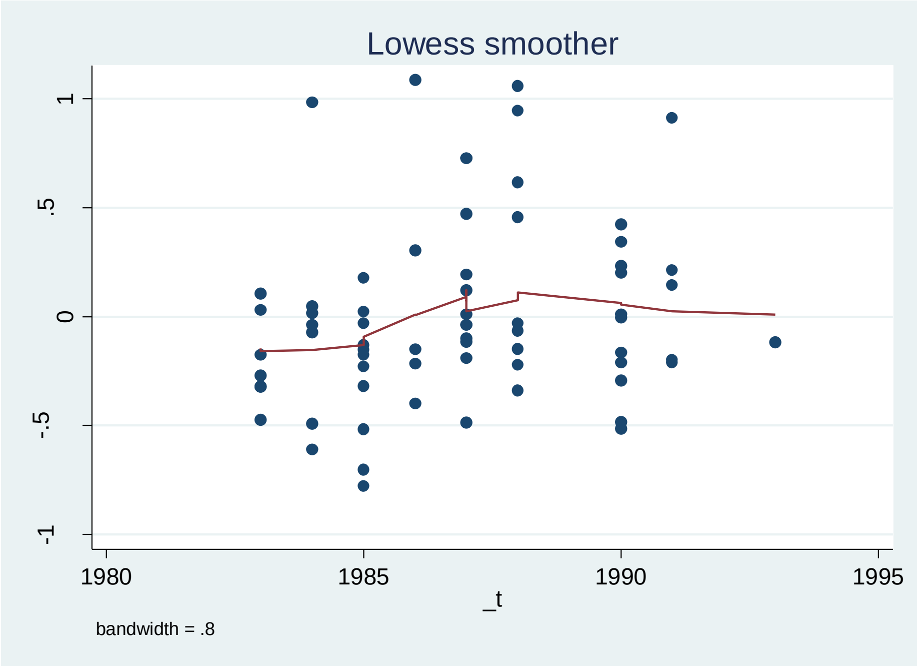


Figure 20: Lowess Graph for Percentage Difference in Unemployment Rate

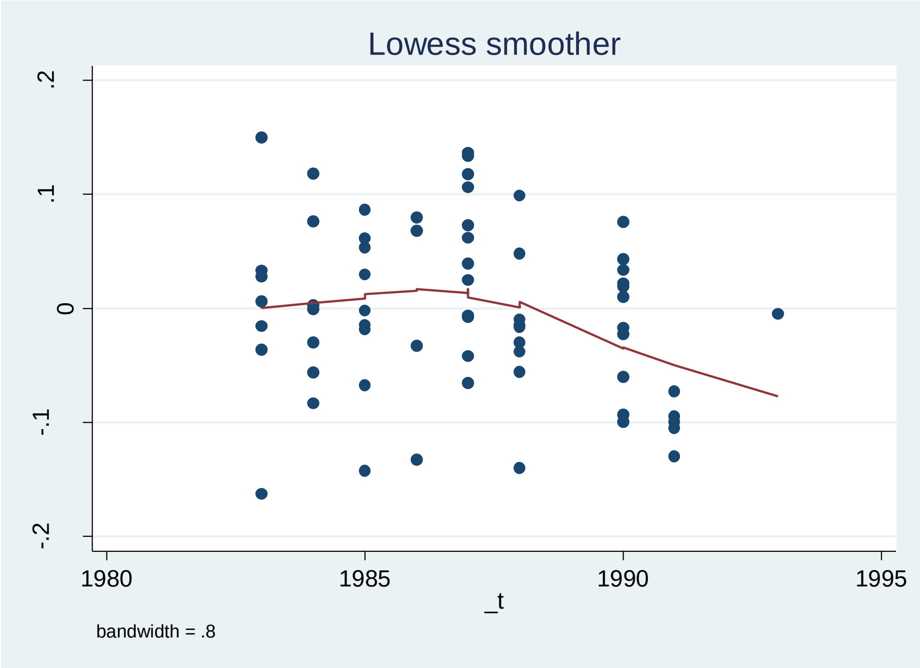


Figure 21: Lowess Graph for Difference in Presidential Vote for Republicans

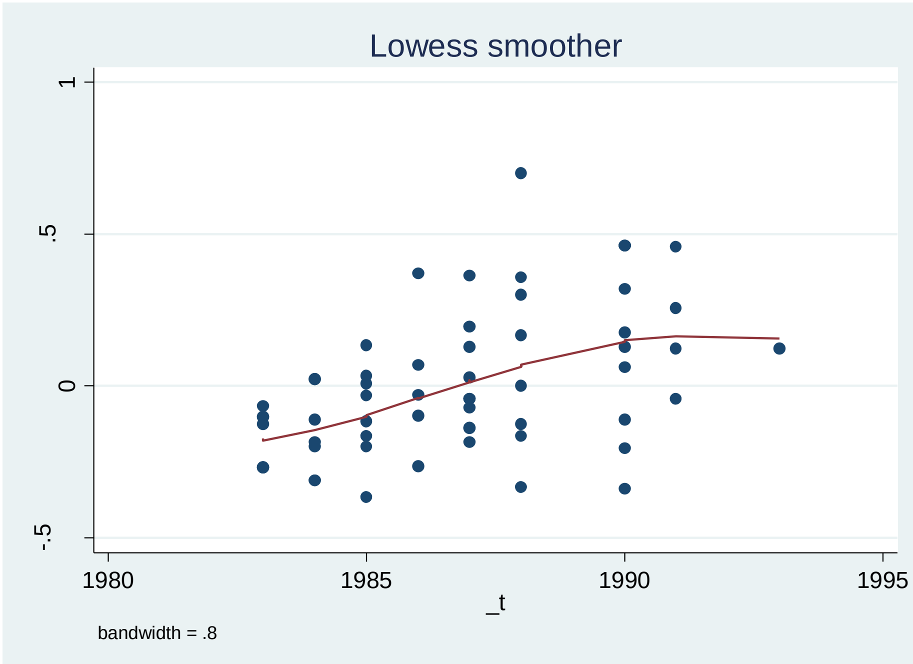


Figure 22: Lowess Graph Percentage of Adjacent Adopters

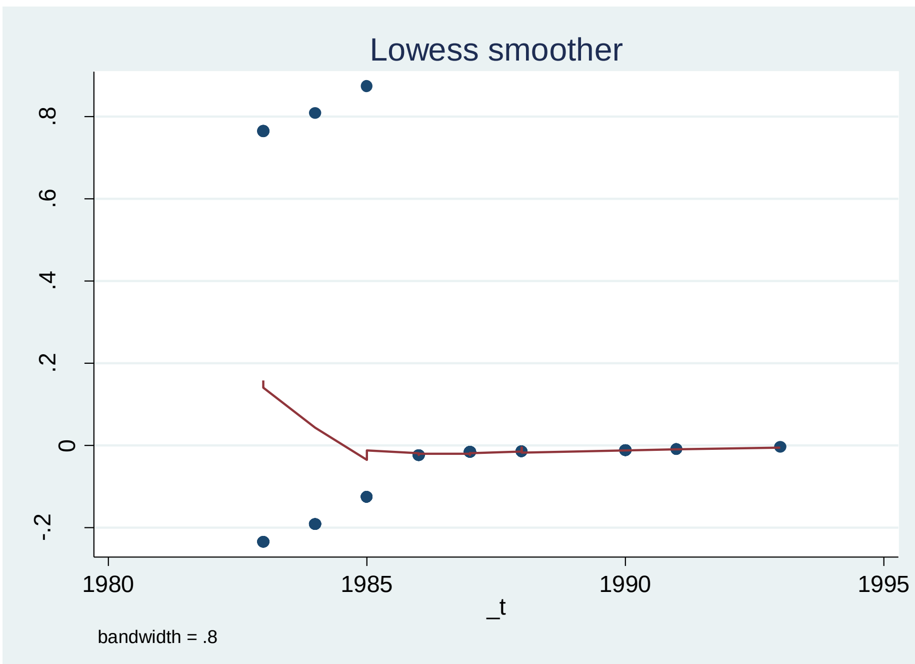


Figure 23: Lowess Graph Bill Sponsorship

The Lowess graphs confirm the proportional hazards violations for the variables in question. In an attempt to achieve a more parsimonious model and to eliminate the violation of proportional hazards assumptions, several modifications were made to the model. First, as discussed in the research methods section, percentage of adjacent adopters is one measure of regional diffusion found in the literature. Another common measure utilizes a dichotomous variables coded 1 if an adjacent geography (state, city, or in this case, county) has adopted and 0 if no adjacent adopters are present. Propinquity, a dichotomous variable, was substituted for percentage of adjacent adopters.

Second, the variable percentage of non-residential tax base was dropped from the model. Two measures of economic distress remain in the model in the form of property tax assessment per capita and sales tax per capita.

Table 63: Cox Regression-Parsimonious

	Hazard Ratio	Std. Error	z	P>z	95% Conf Interval	
Population Density	.9999341	.0002108	-0.31	0.754	.9995209	1.000347
% College Graduates	.9739157	.0328788	-0.78	0.434	.9115602	1.040537
Property Tax Per Capita	.9999786	.0000301	-0.71	0.477	.9999196	1.000038
Sales Tax Per Capita	1.005163	.0055854	0.93	0.354	.9942755	1.01617
Unemploy. Rate	2.04922	.6950128	2.12	0.034	1.054133	3.983656
GOP Vote	.2861186	.5333034	-0.67	0.502	.0074126	11.04387
Propinquity	.5350253	.2547742	-1.31	0.189	.2103972	1.360532
Bill Sponsor	6.675506	4.003078	3.17	0.002	2.060853	21.62327

# of Subjects	2346
# of Failures	68
# of Observation	2346
Times at Risk	4673232
LR chi2(9)	30.34
Prob > chi2	0.0002
Log likelihood	-491.656

The parsimonious Cox model reveals a statistically significant model with bill sponsorship, or representation by a sponsor of the original enterprise zone legislation, and an unemployment rate higher than the state average being significant predictors of enterprise zone adoption. Schoenfeld residuals were tested to ensure the included variables did not violate proportionality assumptions. Population density and difference in presidential vote for republican presidential candidates are both significant, which indicates the proportional hazards assumption is violated. The global test for the model is not significant. Population density will be further explored when Cook County is excluded from the analysis (see forthcoming tables 68-69). Theory suggests that population density and difference in presidential vote for republican candidates should be included in the model. While the variables violate proportional hazards assumptions, neither variable is significant and their inclusion is not expected to alter findings.

Table 64: Cox Proportional Hazards Test for Schoenfeld Residuals -Parsimonious

	Rho	Chi-square	d.f.	Prob> Chi square
Population Density	-0.22139	3.58	1	0.0585
% College Graduates	-0.12146	1.35	1	0.2452
Property Tax Per Capita	-0.05092	0.17	1	0.6830
Sales Tax Per Capita	0.11610	0.74	1	0.3909
Unemploy. Rate	-0.05422	0.14	1	0.7106
GOP Vote	-0.24736	3.50	1	0.0613
Propinquity	0.17429	2.99	1	0.0838
Bill Sponsor	0.06698	0.44	1	0.5063
Global Test		12.78	8	0.1198

After executing the parsimonious Cox model and successfully testing the Schoenfeld residuals, a linktest was executed in STATA to ensure the model was properly specified. A linktest assumes that under a properly specified regression only additional independent variables would be found by chance. The test creates two variables: _hat and _hatsq. The _hat variable is a predicted variable that is expected to be significant. The _hatsq variable should not have explanatory power and therefore not be significant if the model is properly specified (Cleves, Gould, Gutierrez, & Marchenko, 2008; Stata Web Books, 2010).

The linktest for the parsimonious model fails to reject the assumption that the model is specified correctly, which can be interpreted that this model does not have a specification error. The Schoenfeld residuals proportional hazards tests and linktest yield support for a properly specified model meeting Cox assumptions.[9]

Table 65: Linktest for Proper Model Specification

_t	Coef.	Std. Err.	z	P>z	95% Conf. Interval	
_hat	1.054542	.1837292	5.74	0.000	.6944391	1.414644
_hatsq	-.2393713	.1543184	-1.55	0.121	-.5418299	.0630873

# of obs	= 2346
# of subjects	= 2346
# of failures	= 68
Time at risk	= 4673232
LR chi2(2)	= 33.21
Prob>chi2	= 0.0000
Loglikelihood	= -490.22

Cox Regression Minus Cook County

The lowess graph for population density (Figure 15) reveals the presence of a large outlier, Cook County. In the logit modeling, separate models were run excluding Cook County to determine if the presence of Cook County, which contains the City of Chicago, influenced the results. Although not reported here, several models were

[9] It is common in event history modeling for researchers with expectations about the hazard function to test several event history models (for example: loglistic, Cox, Weibull) and utilize Bayesian information criterion (BIC) and/or Akaike information criterion (AIC) to select the best fitting model. This analysis utilized a slightly different approach given no reasonable hypotheses could be made about the baseline hazard function. Logit (aggregate data, early, middle, and late adopters) and Cox regression models were used instead. Comparisons of findings will be made in the concluding chapter.

executed including the percentage of adjacent adopters and percentage of non-residential tax base variables. Both variables violated the proportional hazards assumptions in these models as well. The parsimonious model minus Cook County is reported.

Table 66: Cox Regression-Parsimonious Model Minus Cook County

	Hazard Ratio	Std. Error	z	P>z	95% Conf Interval	
Population Density	1.000454	.0006618	0.69	0.493	.9991577	1.001752
% College Graduates	.967795	.0358145	-0.88	0.376	.9000851	1.040598
Property Tax Per Capita	.9999779	.0000308	-0.72	0.473	.9999176	1.000038
Sales Tax Per Capita	1.004389	.0057262	0.77	0.442	.9932285	1.015675
Unemploy. Rate	2.06157	.7073151	2.11	0.035	1.052337	4.038698
GOP Vote	.2952126	.5492459	-0.66	0.512	.0076996	11.31889
Propinquity	.5228739	.2499128	-1.36	0.175	.2049069	1.33425
Bill Sponsor	6.897269	4.286807	3.11	0.002	2.040029	23.31943

# of Subjects	2323
# of Failures	67
# of Observation	2323
Times at Risk	4673232
LR chi2(9)	29.81
Prob > chi2	0.0002
Log likelihood	-483.589

The parsimonious Cox model without Cook County supports the earlier findings. The difference in unemployment rate and representation by a bill sponsor are significantly related to enterprise zone adoption. The proportional hazards test for

Schoenfeld residuals also reveals no significant variables at the 0.05 significance level (although difference in support for republican candidates is significant at the 0.1 level). The overall model is also not significant.

Table 67: Cox Proportional Hazards Test for Schoenfeld Residuals -Parsimonious Minus Cook County

	Rho	Chi-square	d.f.	Prob> Chi square
Population Density	-0.24274	1.91	1	0.1669
% College Graduates	-0.06756	0.42	1	0.5183
Property Tax Per Capita	-0.03946	0.10	1	0.7500
Sales Tax Per Capita	0.14439	1.14	1	0.2852
Unemploy. Rate	-0.03437	0.05	1	0.8165
GOP Vote	-0.23761	3.10	1	0.0785
Propinquity	0.17066	2.79	1	0.0947
Bill Sponsor	0.05075	0.26	1	0.6108
Global Test		**11.84**	**8**	**0.1586**

Sensitivity Analysis

It is frequently recommended that a sensitivity analysis be conducted to determine if coefficients change as different starting points are used for covariates (Garson, n.d.). This analysis includes county level data for the time period 1981 to 2003. The first enterprise zones were adopted in 1983 and the last county to adopt an enterprise zone for the first time occurred in 1993. Three sensitivity analyzes were conducted. The first analysis (Figure 70) dropped data from years 1981-1982. The model and accompanying proportional hazards test (Figure 71) supported the previous parsimonious models demonstrating the difference in unemployment rate and representation by a bill sponsor were significant predictors. The second sensitivity analysis eliminated date from 1981-1984. This model (Figure 72) similarly found unemployment rate and bill sponsorship were significant predictors. The last sensitivity model included data beginning in 1981 but eliminated data from 1994-2003 after the last enterprise zone was adopted by first time adopters. This model (Figure 74) also found unemployment rate and bill sponsorship were the only significant predictors.

Table 68: Cox Regression-Parsimonious Model 1983 Start Date

	Hazard Ratio	Std. Error	z	P>z	95% Conf Interval	
Population Density	.9999341	.0002108	-0.31	0.754	.9995209	1.000347
% College Graduates	.9739157	.0328788	-0.78	0.434	.9115602	1.040537
Property Tax Per Capita	.9999786	.0000301	-0.71	0.477	.9999196	1.000038
Sales Tax Per Capita	1.005163	.0055854	0.93	0.354	.9942755	1.01617
Unemploy. Rate	2.04922	.6950128	2.12	0.034	1.054133	3.983656
GOP Vote	.2861186	.5333034	-0.67	0.502	.0074126	11.04387
Propinquity	.5350253	.2547742	-1.31	0.189	.2103972	1.360532
Bill Sponsor	6.675506	4.003078	3.17	0.002	2.060853	21.62327

# of Subjects	2142
# of Failures	68
# of Observation	2142
Times at Risk	4269006
LR chi2(9)	30.34
Prob > chi2	0.0002
Log likelihood	-491.656

Table 69: Cox Proportional Hazards Test for Schoenfeld Residuals -Parsimonious Minus Cook County 1983 Start Date

	Rho	Chi-square	d.f.	Prob> Chi square
Population Density	-0.22139	3.58	1	0.0585
% College Graduates	-0.12146	1.35	1	0.2452
Property Tax Per Capita	-0.05092	0.17	1	0.6830
Sales Tax Per Capita	0.11610	0.74	1	0.3909
Unemploy. Rate	-0.05422	0.14	1	0.7106
GOP Vote	-0.24736	3.50	1	0.0613
Propinquity	0.17429	2.99	1	0.0838
Bill Sponsor	0.06698	0.44	1	0.5063
Global Test		12.78	8	0.1198

Table 70: Cox Regression-Parsimonious Model 1985 Start Date

	Hazard Ratio	Std. Error	z	P>z	95% Conf Interval	
Population Density	.9992892	.0009005	-0.79	0.430	.997525	1.001056
% College Graduates	.9596607	.0395167	-1.00	0.317	.885252	1.040323
Property Tax Per Capita	.9999884	.0000301	-0.39	0.700	.999929	1.000047
Sales Tax Per Capita	1.006684	.0062313	1.08	0.282	.994544	1.018971
Unemploy. Rate	2.114708	.7865387	2.01	0.044	1.02013	4.383732
GOP Vote	.1355308	.2787773	-0.97	0.331	.002405	7.636598
Propinquity	1.014489	.7824335	0.02	0.985	.223743	4.599852
Bill Sponsor	6.251736	6.866482	1.67	0.095	.726270	53.81491

# of Subjects	1938
# of Failures	54
# of Observation	1938
Times at Risk	3864372
LR chi2(9)	19.78
Prob > chi2	0.0112
Log likelihood	-389.90369

Table 71: Cox Proportional Hazards Test for Schoenfeld Residuals -Parsimonious Minus Cook County 1985 Start Date

	Rho	Chi-square	d.f.	Prob> Chi square
Population Density	-0.34036	2.35	1	0.1256
% College Graduates	-0.01856	0.03	1	0.8660
Property Tax Per Capita	-0.14469	0.95	1	0.3307
Sales Tax Per Capita	0.11509	0.65	1	0.4214
Unemploy. Rate	-0.10181	0.39	1	0.5329
GOP Vote	-0.29968	3.79	1	0.0515
Propinquity	0.20688	1.70	1	0.1929
Bill Sponsor	0.09168	0.36	1	0.5490
Global Test		10.23	8	0.2495

Table 72: Cox Regression-Parsimonious Model 1994 End Date

	Hazard Ratio	Std. Error	z	P>z	95% Conf Interval	
Population Density	.9998658	.0002325	-0.58	0.564	.9994102	1.000322
% College Graduates	1.007806	.0318246	0.25	0.805	.947322	1.072152
Property Tax Per Capita	.9999866	.0000241	-0.56	0.578	.9999394	1.000034
Sales Tax Per Capita	1.008836	.0059673	1.49	0.137	.9972076	1.0206
Unemploy. Rate	2.496791	.7721437	2.96	0.003	1.361898	4.577413
GOP Vote	10.40956	19.15692	1.27	0.203	.2824551	383.6326
Propinquity	.7073396	.3300421	-0.74	0.458	.2834395	1.765207
Bill Sponsor	3.546144	2.059931	2.18	0.029	1.135793	11.07168

# of Subjects	1326
# of Failures	68
# of Observation	1326
Times at Risk	2634762
LR chi2(9)	19.30
Prob > chi2	0.0133
Log likelihood	-432.5377

Table 73: Cox Proportional Hazards Test for Schoenfeld Residuals -Parsimonious Minus Cook County 1994 End Date

	Rho	Chi-square	d.f.	Prob> Chi square
Population Density	-0.21245	3.92	1	0.0476
% College Graduates	-0.08743	0.61	1	0.4350
Property Tax Per Capita	-0.02425	0.02	1	0.8795
Sales Tax Per Capita	0.12538	0.91	1	0.3392
Unemploy. Rate	0.12115	0.59	1	0.4411
GOP Vote	-0.12660	0.86	1	0.3547
Propinquity	0.14952	1.97	1	0.1606
Bill Sponsor	0.03605	0.12	1	0.7337
Global Test		12.09	8	0.1472

The multiple models tested using Cox regression reach consistent findings that the difference in unemployment rate and representation by a sponsor of the enterprise zone legislation are positively correlated with enterprise zone adoption. This holds true even with the exclusion of Cook County and sensitivity analyses. The hazard ratio can be interpreted as the "probability of the event occurring in time t + 1, given survival to time t" (Garson, n.d.). The more the ratio is above 1, the greater the increase in the odds of the event occurring (Garson, n.d.). A hazard ratio of 6.67 for bill sponsorship and 2.04 for the percentage difference in unemployment rate suggest that there is a greater increase in the odds of the event occurring for representation by bill sponsor than there is for having a higher percentage of unemployment for a county relative to the state average.

For bill sponsorship, the findings could also be interpreted such that for a county represented by a bill sponsor that had not adopted an enterprise zone would 6.67 times more likely to adopt an enterprise zone in the next period compared to a county not represented by a bill sponsor. Likewise, each unit difference in higher unemployment rate compared to the state average means a county would be two times more likely to adopt in the next period.

VII: Results and Conclusions

This chapter reviews the results found from the various modeling approaches and discusses the potential policy implications of this research. The chapter begins by reviewing each hypothesis, the expected relationship to adoption, and the results from the modeling approaches. These results are summarized in Table 76 following the text.

Internal: Demographics

H1: Counties that have a smaller population are more likely to adopt an enterprise zone.

Research suggests that counties with a smaller population may be more likely to follow a state sponsored program and, in this case, adopt an enterprise zone. In this analysis, county size was examined using population and population density measures. Steps were taken to ensure Cook County (City of Chicago), an outlier in the analysis, did not influence the results by executing each statistic including and excluding Cook County.

The bivariate analysis of the collapsed dataset (i.e. average county population/population density over the study period) showed significant differences for population (log of) and population density (log of). The t-tests found counties with a significant difference in population between adopters and non-adopters with adopters having a larger population/population density average over the study period.

Contrary to the bivariate analysis, logit and Cox analyses found that population density had no effect on adoption. In some Cox models, population density violated the proportional hazards assumption, which made interpretation difficult and suggested the variable was not appropriate for inclusion in Cox analysis. Though not reported as a table in the dissertation, attempts were made to transform the population density variable through log transformation. The transformed variable remained not significant and the untransformed variable population density was kept in the analysis. As discussed in the model building chapter, the interpretation of transformed variables in hazard modeling is challenging at best and nonsensical at times.

Internal: Economic

H2: Counties that have greater human capital are more likely to pursue demand-side policies and are therefore less likely to adopt an enterprise zone.

Human capital was measured as the difference in the number of college graduates relative to the state average. This variable was included as the best available measure of human capital that existed over the study period. The findings for bivariate, logit, and Cox analyses consistently found the variable not significant. It is likely that human capital may still influence adoption, but manifest itself in other ways—such as policy entrepreneurship.

H3: Counties that have greater fiscal capacity (i.e. slack resources) have more economic development options and are therefore less likely to adopt an enterprise zone.

This hypothesis was examined through three variables: a) equalized assessed value of annualized property tax revenue per capita, b) sales tax per capita, and c) percentage of property tax base that is non-residential. Results varied depending on the method of analysis. Utilizing bivariate analyses, the initial t-test for property tax revenue per capita supported the hypothesis finding that the mean property tax revenue per capita for non-adopters was significantly higher than for adopters and find the mean percentage of non-residential tax base for adopters significantly lower than for non-adopters. Sales tax per capita was contrary to the hypothesis with the sales tax per capita for adopters being significantly higher than non-adopters. Once all three measures were included in the collapsed logit analysis, only sales tax per capita became significant with adopters having a higher sales tax per capita than non-adopters.

As discussed in the research methods chapter, the preferred means for analyzing diffusion is through event history analysis. The Cox regression did not find sales tax per capita or property tax revenue per capita significant. The variable percentage of non-residential tax base did not meet the proportional hazards assumption. These findings suggest that enterprise zones are pursued without respect to the fiscal capacity or needs of a county government.

H4: Counties that suffer from more severe economic crises will be more likely rely on supply-side policies and are more likely to adopt an enterprise zone.

Economic crisis was measured as the percentage difference in annual unemployment rate from the state average. The bivariate and logit analyses on collapsed data did not find any significant differences in the unemployment rate differences from the state average for adopters and non-adopters. Cox regression found each unit difference in higher unemployment rate compared to the state average means a county would be 2 times more likely to adopt in the next period. This suggests that counties having an enterprise zone adopted within their boundaries experience not only higher unemployment within the narrowly defined geographic boundaries of an enterprise zone, but also within the much larger county itself.

Internal: Political and Policy Entrepreneur

H5: Counties with a more conservative political orientation are more likely to support supply side policies and are therefore more likely to adopt an enterprise zone.

Political orientation was measured as a deviation from the statewide vote for Republicans in two-party vote in an average of most recent presidential elections measured as county percentage vote Republican minus state average vote Republican. Contrary to the hypothesis, the bivariate t-test revealed that the percentage deviation for adopters is statistically significantly lower than for non-adopters, which suggests that counties voting for Republicans at a lower percentage are more likely to adopt.

Once this variable was included in the logit analysis and Cox regression, this variable was not significant. The variable did violate the proportional hazards assumption at the 0.10 level in several of the Cox models, but remained in the analysis because theory supported its inclusion. While enterprise zones are a supply side policy typically associated with Republicans at the national level, it is reasonable to assume the willingness to adopt this innovation may not be influenced by party affiliation at the local levels. The state level legislation authorizing enterprise zones in Illinois was a bipartisan bill with both Democratic and Republican co-sponsors, which might mitigate any national partisanship associated with this policy preference. Additionally, as discussed in the Illinois Enterprise Zone chapter, the compromised enterprise zone legislation eventually passed by the Illinois legislature in December 1982 did not contain the minimum wage exemptions and lessened health and safety regulations contained in the proposed 1979 bill.

Internal: Political and Policy Entrepreneur

H6: Counties represented or partially represented by primary sponsors of enterprise zone legislation are more likely to adopt an enterprise zone.

The Pearson's chi-square, bivariate analysis revealed that counties represented by a bill sponsor adopted enterprise zones at a higher level than chance; however, bill sponsorship was not significant in the collapsed logit models. Under the Cox regression, a hazard ratio of 6.67 for bill sponsorship suggests that there is a greater increase in the odds of the event occurring for representation by bill sponsor than for a county represented by a non-sponsor. For bill sponsorship, the findings could also be interpreted such that for a county represented by a bill sponsor that had not adopted an enterprise zone would 6.67 times more likely to adopt an enterprise zone in the next period compared to a county not represented by an enterprise zone. These findings yield strong support for the role of policy entrepreneurs in driving policy innovation and adoption. The role of bill sponsors probably includes not only their formal actions as legislators, but also their informal actions to advance and encourage adoption in their districts. This is analogous to product champions found in technological innovation literature (Tornatzky & Fleischer, 1990).

H7: Counties located adjacent to previous adopters are more likely to adopt.

This variable was measured in the logit analysis using percentage of adjacent adopters. However, the percentage of adjacent adopters did not meet the proportional hazards assumption for Cox regression. The Cox analysis used propinquity, a dichotomous variable with one or more adjacent adopters = 1 and no adjacent adopters = 0. In all cases, the variable was not significant in predicting adoption.

H8: Political determinants will have a larger effect size on enterprise zone adoption than economic determinants.

H9: Political determinants will have a larger effect size than demographic determinants.

H10: Demographic determinants will have a larger effect size than economic determinants.

Hypotheses 8-10 examined the relative effect size of demographic, economic, and political variables. The Cox regression revealed only two significant variables: representation by a bill sponsor and unemployment rate difference. Bill sponsorship has a larger effect size indicating that political variables had the largest effect followed by economic effects. Demographics were not significant.

H11: The diffusion of innovation of enterprise zones follows a logistic "S" curve.

Diffusion of innovation patterns were examined using visual inspection of pattern of adoption. The data reveal a pattern with some adopters, many middle adopters, and fewer late adopters. When plotted, the data resembles a logistic "S" curve and natural breaks in the data exist for some early, middle, and late adopters. This is consistent with prior diffusion of innovation studies.

Table 74: Summary of Model Results

Hypothesis	Logit Models	Cox Model	Modeling Direction	Expected Direction	Add'l Notes
Internal: Demographics					
H1: Counties that have a smaller population are more likely to adopt an enterprise zone.	Non-significant	Non-significant	N/A	-	Proportional hazards violated in Cox

Table 74 Continued

Internal: Economic					
H2: Counties that have greater human capital are more likely to pursue demand-side policies and are therefore less likely to adopt an enterprise zone.	Non-significant	Non-significant	N/A	-	
H3: Counties that have greater fiscal capacity (i.e. slack resources) have more economic development options and are therefore less likely to adopt an enterprise zone.	Significant (sales tax per capita)	Non-significant	+ (logit)	-	
H4: Counties that suffer from more severe economic crises will be more likely rely on supply-side policies and are more likely to adopt an enterprise zone.	Non-significant	Significant (unemployment rate)	+ (Cox)	+	

Table 74 Continued

Internal: Political & Policy Entrepreneur					
H5: Counties with a more conservative political orientation are more likely to support supply side policies and are therefore more likely to adopt an enterprise zone.	Non-significant	Non-significant	N/A	+	
H6: Counties represented or partially represented by primary sponsors of enterprise zone legislation are more likely to adopt an enterprise zone.	Non-significant	Significant	N/A	+	
External: Regional Diffusion					
H7: Counties located adjacent to previous adopters are more likely to adopt.	Non-significant	Non-significant	N/A	+	Measured using propinquity in Cox due to proportional hazards violation

Table 74 Continued

Relative Effect Size				
H8: Political determinants will have a larger effect size on enterprise zone adoption than economic determinants.	Political determinants/policy entrepreneurship in the form of representation by a bill sponsor had a larger effect in Cox than unemployment rate difference, which was the only other significant variable.	+	+	
H9: Political determinants will have a larger effect size than demographic determinants.	In this study, political determinants were significant, but demographic determinants were not.	+	+	
H10: Demographic determinants will have a larger effect size than economic determinants.	In this study, economic determinants were significant, but demographic determinants were not.	-	+	
Rate of Diffusion				
H11: The diffusion of innovation of enterprise zones follows a logistic "S" curve.	Diffusion of innovation patterns were examined using visual inspection of pattern of adoption. The data reveal a pattern with fewer early adopters, many middle adopters, and fewer late adopters. When plotted, the data resembles a logistic "S" curve and natural breaks in the data exist for early, middle, and late adopters.			

Alternative Explanations

Several alternative explanations exist about the certification and expansion of enterprise zones that are beyond the scope of available data. First, the legislation authorizing enterprise zones in Illinois allowed for the creation of eight zones per year for the first six years (later amended in 1984 to eight zones per year). These zones were certified and administered by the Illinois Department of Commerce and Community Affairs (DCCA). The zones were designated on a competitive basis utilizing criteria which included unemployment, income, poverty, or population loss. The researcher was unable to find transcripts or other descriptive documentation regarding how the initial enterprise zones were selected or the qualitative or quantitative weight applied to each criterion. No information was found on how many applications were received during the initial years of the program. One could assume demand for zone designation outstripped the available number given the increase from six to eight zones designated per year in 1984. This dissertation was undertaken over 25 years after the first zones were designated, so it was not feasible or cost effective to attempt to locate and interview individuals responsible for initial certification. It is possible that bill sponsors were disproportionally awarded certifications in areas they represented even if those areas were not as competitive as other applicants. Other possibilities include political pressure to build support for the program and designate initial zones in rural and urban areas throughout the state to build political and popular support for the program. Despite communities voluntarily seeking to adopt an enterprise zone, such top down allocations for the initial zones would the limit the statistical significance of population/population density and regional diffusion variables.

Secondly, the decision to use counties as the level and measure of analysis represents the best available level of analysis. It is reasonable to assume that county governments would play a role in seeking enterprise zone adoption and in many cases the county was the lead agency. McDonald's (1993) research also suggested community groups and other local governments played a key role in seeking enterprise zone designation. It is possible that community groups or other levels of government played key roles that are masked by the application of county as the level of analysis. As discussed in the methods chapter, counties represent a common level of analysis in local government studies and served as the smallest unit of government for which much of the demographic and socio-economic data is collected that was used in this study. Scholars have acknowledged that innovations rarely occur on one level alone and studies are enhanced when additional levels can be included in the analysis (Tornatzky & Fleischer, 1990).

Lastly, McDonald (1993) also noted the original intent of enterprise zones to benefit distressed areas was lost as the zones proliferated across the state. This dissertation attempted to test McDonald's assertion that the characteristics of enterprise zone adopters may have changed as the number of zones increased. This was done through an early, middle, and late stage adopter approach using logit and through Cox regression which tested the proportional hazards assumption through the study period for the relevant variables. No evidence was found through statistical analysis to suggest that the characteristics of adopters changed over the study period. However, it is possible that explanations exist differentiating early, middle, and late adopters that are beyond the reach of the available data and statistical analysis.

Conclusions and Policy Implications

The intent of this study was to develop a predictive model explaining enterprise zone adoption in Illinois. This study has limited generalizablity beyond Illinois and limited generalizability in application to mandated or non-voluntary enterprise zone adoption. However, the study provided an opportunity to test many of prior assumptions about the drivers of policy innovation at the local government level, which are rarely examined in the academic literature.

For a normative perspective, these findings should be encouraging. The findings support the importance of policy entrepreneurs, especially state legislators, in driving policy innovation in their districts. However, the enterprise zones were designated in counties with a higher than average unemployment rate suggesting those counties in economic need were more likely to receive the intended benefit.

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