DO COUNTY LEVEL COMPREHENSIVE PLANS IMPACT REGIONAL ECONOMIC GROWTH?

By

VIRGINIA LOUISE ALLISON

(Under the Direction of Jeffrey H. Dorfman)

ABSTRACT

Land is an increasingly scarce resource, and all levels of government must make conscientious decisions when planning and adopting zoning ordinances. This thesis looks at land use planning and zoning standards in Georgia counties to see how various plans, standards, and enforcements influence the economic growth at the county level. The motivation for this paper comes from The Georgia Planning Act passed in 1989 requiring all counties to adopt a comprehensive plan in order to receive state funding. The main research question this paper asks is if regional planning has a significant impact on counties' economic growth. We examine the broad questions with models that explain economic growth measures as a function of variables describing county zoning, consistency in following long range plans, follow through in implementation, and innovativeness of the plans.

INDEX WORDS: comprehensive plan, economic growth, economic development, community development, Georgia Planning Act, land economics, county government

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DEDICATION

To my Dad, Alan Allison, for allowing me to believe I could do anything. This is your master's degree as much as it is mine.

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CHAPTER 1

INTRODUCTION

Background

Land use planning dates back to the early twentieth century in the United States where the customary practice in most states was to delegate regulation of land to local governments, what we refer to today as zoning (Kelly 2000). Who benefits from local comprehensive planning? How should counties invest millions of dollars into creating plans, hiring trained planners, and investing energy into it? As one of the United States most precious and valuable assets, land use and investment must be conscientiously monitored and regulated. To protect the land we have, developed and undeveloped, it is important to understand and appreciate the role planning plays and the influence different levels of governments can have. In most states comprehensive plans are required at the county and regional levels in order for the local governments to receive specific state-allocated funds.

According to the American Planning Association, planning enables community leaders to improve the social welfare of their citizens. A job well done offers better choices for where and how people live while keeping the future in mind; communities accomplish this by creating goals, evaluating problems, and suggesting solutions (American Planning Association 2013). Benefits of planning included the promotion of orderly and rational development, protection of natural and historic resources and the environment, protection of private property rights, promotion of economic development, and the protection of

public health, just to name a few. Improved quality of life associated with planning contributes to economic development as it is an important factor to businesses when considering where to locate (Georgia Department of Community Affairs).

Though all levels of governments make various types of plans, the comprehensive plan is the "only planning document that considers multiple programs and that accounts for activities on all land located within the planning area, whether that property is public or private" (Kelly 2000). The objective of the comprehensive plan typically falls under the government's police power by protecting the public's health, safety, and welfare (Kelly 2004). Three key factors that must be included in a comprehensive plan are the geographical area where the plan is to take place, the issues that the plan is responsible for including transportation, land use, historic preservation, infrastructure, parks, etc., and the time horizon over which the plan is to be implemented (Kelly 2000; Kelly 2004). Planning is necessary for a community to look to the future and decide the direction it wants to take. Most professional planners help prepare, analyze and implement comprehensive plans at the local level since that is where most planning of this nature takes place. Due to all the different elements considered in a comprehensive plan, some planners will specialize in specific types of planning including transportation systems, parks, downtowns, jobs, or housing (Kelly 2000).

The Georgia Planning Act of 1989 recognized that "coordinated and comprehensive planning by all levels of government within the State of Georgia is of vital importance to the state and its citizens" (Article 6). Specific intentions defined by the Georgia legislature in this Act include giving the Department of Community Affairs (DCA) the ability to assist with the preparation and implementation of comprehensive plans for local governments and

help with comprehensive plans for the state (50-8-7.1). It also created the Regional Development Centers (RDC's) around the state to "…develop, promote and assist in establishing coordinated and comprehensive planning in the state…"; each RDC reviews all local plans for approval and comments and must keep files of all local plans "for inspection by the public" (Article 2).

Among the Rules of Georgia Department of Community Affairs, Chapter 110-12-1 (2013) defines the minimum standards and procedures for local comprehensive planning. This "provides a framework for the development, management and implementation of local comprehensive plans at the local, regional, and state government level" (page 1) in an effort to maximize economic prosperity at the local and state levels.

Authority for DCA to create standards for comprehensive plans is given in Official Code of Georgia Annotated (O.C.G.A.) § 50-8-1. All local governments "must prepare, adopt, maintain, and implement a comprehensive plan as specified" to receive state funds and maintain status as a qualified local government. In the original 1989 Rules for Minimum Local Planning Standards, which were in effect until 2004, six planning elements were required by local government comprehensive plans. These required elements include: population, economic development, natural and historic resources, community facilities and services, housing, and land use. The detailed purpose and minimum requirement for each element can be found in Chapter 110-12-1-.04 (1989).

The DCA's Minimum Standards and Procedures for Local Comprehensive Planning have been updated three times since the original six elements required for all county plans, with the most current updates in 2013. According to current procedures, only three elements are required by all counties—community goals, needs and opportunities, and

community work programs—with other elements required for specific county attributes (Chapter 110-12-1-.02). Appendix A contains the table from DCA's current Standards and Procedures for Comprehensive Plans. Exact details for plan elements and procedures may be found in Chapter 110-12-1-.03 and 110-12-1-.04, respectively, of Minimum Standards and Procedures for Local Comprehensive Planning (2013).

While reading any DCA manual, or any literature on comprehensive planning for that matter, you will come across a list of planning benefits (Kelly 2000; Kelly 2004; Scott 1995). The positive impact of comprehensive planning on economic development is without fail a top benefit on every list; however, without empirical evidence, intuition can only take county residents, planners, and developers so far. It is in this paper we examine the accuracy of this long accepted economic benefit of planning.

Motivation

Land is one of the United States' most scarce resources, because of this all levels of government must make conscientious decisions when planning land use patterns and adopting zoning ordinances. As an essential element and fundamental activity to the United States growth, some of the first efforts of planning can be seen during the Civil War era when the U.S. government was trying to open the west with the Homestead Act of 1862. This act granted parcels of land in quarter-sections (160 acres) to any person willing to first settle on it, improve it or use it in a productive way (Fishman 2000).

Land values, though influenced by many variables, are directly related to supply and demand for land in a given area. Land use zoning, from an economic perspective, is "seen as an exercise in resource allocation" (Heikkila 2000). Since there is a limited amount of land

within cities' and counties' control, local governments must cautiously and intentionally consider what is best for the future of their community and its constituents.

An important component of comprehensive planning is zoning, which is the division of land into various use-specific districts such as residential, commercial, and public land. Much of the potential development and planning for a city is strongly influence by zoning standards (Kelly 2004). Though there are almost a limitless number of factors that can affect a community's economic development, zoning plays an influential part. A state-wide investigation of the economic development benefits related to zoning was conducted in 2001 by the Department of Community Affairs for the State of Georgia. This study found that zoning has a significant positive impact on employment and property values in the community (Wilkins 2001). We use this as a guide and spring-board, along with intuition, to develop our own county planning specific survey and formulate hypotheses.

Economic and community growth are buzzwords to attract businesses and residents because many municipalities realize the need to develop and capitalize on existing infrastructure as part of the planning process for economic growth (Altshuler, 1965). This paper looks at the quality of planning and zoning in Georgia counties to see how various plans, standards, and enforcements influence a county's economic growth. There is little in the literature exploring the causal links between land use, regional planning and economic prosperity. Government intervention impacts the regional economy in positive and negative ways such as preserving public goods, implementing amenity improvements, improving transportation options available, or possibly failing to control urban sprawl through poor development management (Kim, 2010). However, the question addressed in

this paper is: do all the benefits of good land use planning include increased job growth, increased average earnings, and more hospitals in the county?

Motivation for this paper comes from The Georgia Planning Act passed in 1989 requiring all counties to adopt a comprehensive land use plan. The main research question this paper asks is do the quality and consistency of local planning have a significant impact on counties' economic growth? Do the counties with better long-range comprehensive plans receive a return for that effort in the form of higher employment or income gains? Specifically, do counties with better comprehensive plans and more faithful implementation of their plans benefit from a greater amount of economic prosperity? We also expect counties with more innovative comprehensive plans and thorough zoning standards to see increased returns in economic growth compared to counties with more relaxed comprehensive plans and zoning regulations. These questions will be addressed using data on planning and economic conditions in 94 Georgia counties from 1990 to 2000 and their subsequent employment and income growth from 2000 to 2005. Exploring the impacts of comprehensive plans on county economic growth benefits Georgia policy makers, planners, and most importantly, citizens who vote on these plans. Though most variables seem theoretically and intuitively obvious, this thesis aims to look at them in a complete model to minimize the possibility for confounding variables, and to produce empirical evidence to support future policy decisions.

CHAPTER 2

LITERATURE REVIEW AND MODEL DEVELOPMENT

Though it seems intuitive, there has been little attention in previous research investigating the impact of comprehensive planning on job growth and no empirical evidence to back it up. Kim refers to this as a "bottom up" impact—as opposed to looking at the influence of job growth and economic development on comprehensive planning; considering does planning "really promote a region's economic well-being?" (Kim 2011). To support our models of economic development, we look to the literature and rely on intuition of what is expected to influence county economic development.

There is much debate in the literature about which comes first, jobs or people. According to a study in 2003, Partridge finds that people follow jobs. Employment shifts are more likely to be determined by labor demand shocks, as people follow jobs, than migration innovations (Partridge 2003). Export base theory also assumes that employment growth is exogenous and a determinant of population growth. However, the majority of studies find that population and employment growth are interrelated and simultaneously determined (Carlino and Mills 1987). Other determining factors of population growth include natural amenities in an area as population growth in both urban and rural areas has equalized. Natural amenities are also correlated with economic growth. A general conclusion identified by Deller et al. found that the majority of amenity attributes are positively related to economic growth (Deller et al 2001).

As the literature tells us, we expect county economic development to have numerous influences. To account for this, other independent variables included in the model are population growth over the decade 1990-2000; rurality; median county home price; education; a natural amenity index created by USDA; distance to a metropolitan statistical area (MSA); distance to a city with a population of one half million; and industry mix growth over 1995-2000. The USDA's natural amenity index rank's counties amenity value on a scale of 1-7, ranging from few to many for natural resource amenities found in the respective counties. We include the natural amenity index to control for population growth in our model as suggested by the literature. An MSA is an urban area with a core of 50,000 people or more, containing one or more counties with significant economic impact (U.S. Census). Industry mix growth 1995-2000 measures how industries in the county grew over the six year time period; counties with higher scores have more growing industries. The two different dependent variables as measures of county economic development include: new jobs created between 2000-2005 and change in average earnings from 2000-2005. We use the five-year span 2000-2005 for the two models to avoid effects created by the 2007-2009 recession in hopes of obtaining a more accurate and typical insight into Georgia county planning and economic interactions.

CHAPTER 3

DATA

The amount of planning required or suggested for a county does not have a specific or definitive answer; however, we surveyed planning professionals around the state in an attempt to collect data on the 159 Georgia counties' long-range comprehensive plans[1]. These planning professionals include people working in the twelve regional commission offices around the state who help counties prepare their comprehensive plan, as well as employees at the Department of Community Affairs state office. We created survey questions based on evidence in the literature regarding planning influences and considerations, as well as our natural interest in certain planning effects. A copy of the survey can be found in Appendix A. Data from this survey serve as measures of the quality and consistency of planning in each county. Questions were asked about the degree of plan innovation for the year 2000, basic zoning standards in 2000, and thoroughness of the 2000 plan. These responses are used to create variables that attempt to quantitatively measure planning for counties in Georgia.

The newly created planning variables from the Georgia Counties Planning Survey were coded into 14 unique dummy variables. Five survey questions and responses were used to create the 14 survey-specific dummies. When rating a county's zoning standards in 2000 there were four possible responses. Three dummy variables were created that equal one for counties judged to have 2000 zoning standards that were comprehensive, average

[1] For this study we followed appropriate IRB procedure to collect data.

and minimal, respectively. No variable was created for the rating nonexistent which serves as the base level. When rating the thoroughness of a county's comprehensive plan in 2000 there were four possible responses. Three dummy variables were created that equal one for counties judged to have comprehensive plans in 2000 that were comprehensive, average and minimal, respectively. No variable was created for the rating nonexistent which serves as the base level. When rating the innovation in a county's plan in 2000 there were four possible responses. Three dummy variables were created that equal one for counties judged to have innovation in a few places, were more innovative than average, and were very innovative, respectively. No variable was created for the rating not at all innovative which serves as the base level. When rating how well the county followed the comprehensive plan over the decade 2000-2010 there were five possible responses. Four dummy variables were created that equal one for counties judged to follow the plan some of the time but rezoning is common, most of the time but a few re-zonings, consistently, and the county did not follow through with the plan and changed it sometime between 2000-2010, respectively. No variable was created for the rating rarely which serves as the base level. When evaluating the credentials of county planners there were three possible responses. A dummy variable that equals one was created for counties who have at least one planner that has a degree in planning. No variable was created for counties whose planner did not have a degree or for responses marked not sure which serves as the base level.

We opt for dummies instead of ranking each response numerically because that would assume we know and treat equally the differences between counties with nonexistent to minimal planning compared to the difference between average and

comprehensive planning. We do not know these differences and believe we will find more accurate relationships between various planning states and the measure of economic growth with the use of dummy variables.

All other variables are a compilation of secondary data from a variety of sources. Two different dependent variables are created, each with its own model. Percentage change in average earnings from 2000 to 2005 and percentage change in average employment from 2000 to 2005 were both derived from the Quarterly Census of Employment and Wages for all industries in 2000 and 2005. This was abstracted from the Georgia Department of Labor's Labor Market Explorer.

Aside from the dummy variables created from our survey, our primary data source for the remaining independent variables is the U.S. Census Bureau. These variables include: total population growth as percent change between 1990 and 2000; total percentage of the population ages 25 and older with a high school diploma or equivalent in 2000; total percentage of the population ages 25 and older with at least a four year college degree in 2000.

Distance to metropolitan statistical area (MSA) measures the distance in kilometers to the nearest MSA using 2003 urban hierarchy definitions defined by the U.S. Census Bureau. An MSA is an urban area with a core of 50,000 people or more, containing more than one county with significant economic impact (U.S. Census). We measure the distance in kilometers to a city with a population of 500,000 residents or more to create a variable that measures the cost of accessing major urban amenities. Cost of living is modeled using the natural log of the median county home price in 2000. We use the log of median county home price because we believe increases in home price have a linear effect in terms of

percent change in home price. For county level natural resource characteristics, we use the USDA's natural amenity index that ranks counties' amenity value on a scale of 1-7 from low to high amenity availability. Rurality is included in the model through the 9-part rural-urban continuum code for 1993 published by the USDA's Economic Research Service. This variable classifies how metropolitan a county is based on population. Counties with a population greater than 1 million are coded as 1 and counties coded as 9 are completely rural with population fewer than 25,000.

Industry mix growth from 1995-measures how industries in a county grow nationally over the given period of time. According to Partridge et al., "A county's industry mix employment growth rate is what would be expected if the county's industries grew at their corresponding national rates" and accounts for local labor demand shifts (Partridge 2008). Basically, industry mix measures how favorable the county's mix of industries is toward job growth. A county with industries that are growing rapidly nationally will have a larger value for this variable.

CHAPTER 4

RESULTS

This chapter will present how we estimate the models using ordinary least squares and tests for heteroscedasticity. We then discuss results that were expected and unexpected, including the job growth resulting from counties who consistently follow the plan. From there we move on to policy implications and recommendations we believe to be helpful based on our results.

Estimation Methodology

The model used to analyze the variables for 94 counties in Georgia is:

(1) $y_{i,Wage}=B_{i0}+B_{i1}X_{i1}+B_{i2}X_{i2}+\cdots+B_{i23}X_{i23}+\varepsilon_i;\ \ \varepsilon_i \sim N(0,\sigma^2),\ \ i=1, 2, \ldots 94$

(2) $y_{i,Jobs}=B_{i0}+B_{i1}X_{i1}+B_{i2}X_{i2}+\cdots+B_{i23}X_{i23}+\varepsilon_i;\ \ \varepsilon_i \sim N(0,\sigma^2),\ \ i=1, 2, \ldots 94$

After averaging responses for counties with more than one response and removing counties with incomplete responses, we ended up with 94 usable county observations. Figure 1 illustrates where all participating counties are located. Though having all 159 Georgia counties would have been ideal, our 61 percent response rate is adequate. A list of the 94 counties included in this study can be found in Appendix C. We opt for a basic linear model to estimate the relationships. To estimate our models we performed standard ordinary least squares regression using STATA.

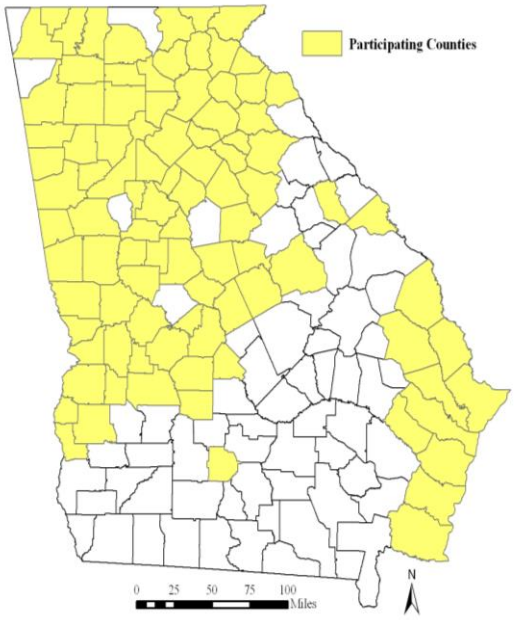

Figure 1. Participating Counties in the Georgia County Planning Survey

Because we are using county level data, it is important to test all three models for heteroscedasticity. Due to our limited degrees of freedom, we used the Breusch-Pagan Test, which tests for heteroscedasticity of a known form (Wooldridge 218). In the Breusch-Pagan test, we regressed the squared residuals of each model on all independent variables except the planning dummies.

The model with county job growth as the dependent variable showed significant signs of heteroscedasticity in the Breusch-Pagan test, with particular heteroscedasticity found due to population growth, median county home price, and high school attainment variables. To correct for this, we re-estimate the model using weighted least squares; the weights are the inverse of the predicted $\hat{y}$ values obtained in the Breusch-Pagan test. Using weighted least squares minimizes the weighted sum of the squared residuals, weighting

each squared residual by $1/w_i$, giving less weight to observations with a higher error variance (Gujarati 373).

These specific forms of heteroscedasticity can be explained by population, median county home price, and high school education attainment. Analyzing the data shows there is one observation that is particularly large, causing the majority of the heteroscedasticity in the models. The squared residual for Quitman County in Model 2 is 0.37, compared to the average county having a squared residual of 0.0012. Between 2000-2005 Quitman county saw 74 percent job growth; this is due to the fact that in 2000 Quitman had less than 100 residents employed according to the Quarterly Census of Wages and Employment. However, county employment jumped in 2005 to just above 400 people. For Quitman County, employment increased drastically, however, the overall numbers are not that significant. The weights applied in the WLS estimation correct for this form of heteroscedasticity.

Empirical Results

Because this study uses county level data, it was not surprising to find heteroscedasticity present. After correcting for it in the employment growth model using Weighted Least Squares, the final results for each model can be seen in Table 1. While the early 2000's were relatively successful in the business world, there are influences based on a county's planning efforts. The following discussion will focus on the variables that we find significant at the α=0.10 level. A complete table of summary statistics can be found in Appendix D.

	Model 1		Model 2	
Variable Name	**Wage**	P>t	**Employment**	P>t
Intercept	-0.4278	0.538	-1.9668	0.264
Thoroughness of 2000 Plan Rated: Minimal	-0.0036	0.940	0.0228	0.769
Thoroughness of 2000 Plan Rated: Average	0.0460	0.364	0.0530	0.545
Thoroughness of 2000 Plan Rated: Comprehensive	0.0633	0.193	0.0851	0.305
Yes, County Planner has degree in planning	0.0156	0.378	0.0017	0.952
Zoning Standards of 2000 Plan Rated: Minimal	-0.0036	0.882	0.1003*	0.067
Zoning Standards of 2000 Plan Rated: Average	-0.0221	0.307	0.1048*	0.012
Zoning Standards of 2000 Plan Rated: Comprehensive	-0.0379	0.148	0.0538	0.323
Some of Plan Followed over 2000-2010	-0.0190	0.615	-0.0261	0.732
Most of Plan Followed over 2000-2010	0.0118	0.753	0.0109	0.883
Plan Consistently Followed over 2000-2010	0.0091	0.830	0.1740*	0.043
Plan Changed over decade 2000-2010	-0.0435	0.312	-0.0391	0.533
2000 Plan was Innovative in a Few Places	-0.0200	0.295	-0.0037	0.922
2000 Plan was Innovative more than average	-0.0258	0.341	-0.0659	0.238
2000 Plan was very innovative	-0.0281	0.557	-0.2677*	0.002
Population Growth 1990-2000	0.0046	0.904	0.3660*	0.000
Rurality 1993	0.0002	0.951	0.0022	0.740
Median County Home Price	0.0951	0.500	0.2961	0.385
Percent County Population with High School Diploma	0.1854	0.472	0.8164	0.136
Percent County Population with College Degree	0.1828	0.670	1.0689	0.186
Amenity Index	0.0103	0.394	-0.0115	0.634
Distance to MSA (km)	-0.0009	0.353	-0.0051*	0.059
Distance to City with 1/2 million population	0.0002	0.270	0.0005	0.163
Industry Mix Growth over 1995-2000	0.0051	0.582	0.0596*	0.028
	$R^2 = 0.2807$		$R^2 = 0.8409$	

Table 1. Parameter Estimates for OLS Models (significant variables at α=0.10 are indicated by *)

For the wage model, our results are insignificant and have very little explanatory power. This could be for several reasons including that there are too many variables missing from our model that serve to determine employee wages. Our model with planning measures, home price, population, and distance from an MSA and large city perhaps does not have enough information to satisfactorily explain county wage levels.

Our results in the model explaining employment growth from 2000-2005 show a number of significant results. Counties with minimal and average zoning standards each experience 10 percent more job growth when compared to counties with no zoning. After testing the significance of the parameter estimates, we find that minimal and average zoning standards are not significantly different than comprehensive zoning. Though we are tempted to say that counties with some zoning guidelines are more attractive to businesses and that too strict zoning standards may turn businesses away, our results suggest that all zoning, at any level, is preferred to having no zoning standards.

The most interesting finding for this model and paper is the additional 17 percent job growth over five years observed for counties who consistently follow their comprehensive plan. Essentially, this means that consistently following through with your plan leads to an extra three percent annual job growth compared to counties who write plans for the sake of writing one to collect dust. Figure 2 shows where the counties who consistently followed their plans are located, illustrating that they encompass counties across the state, including both rural and urban counties. Suggested reasons for this increase in county employment include that businesses prefer predictability and want to locate in counties that can be depended upon to follow through and fulfill their promises.

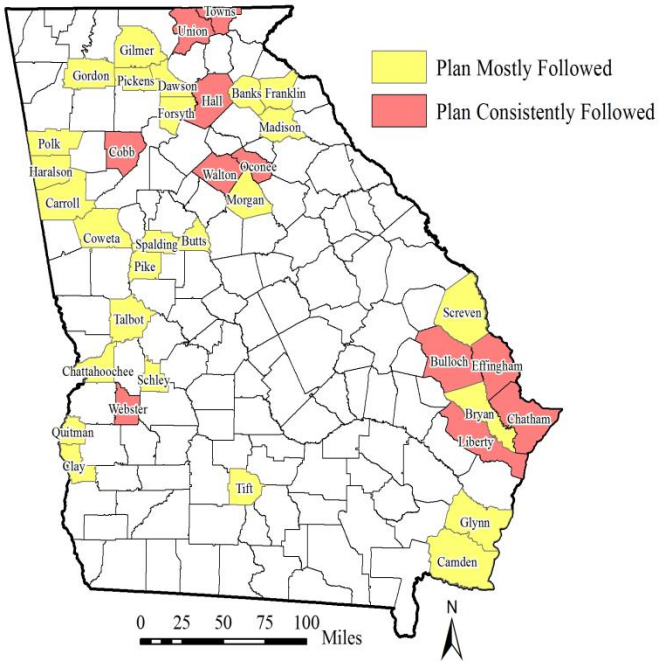

Figure 2. Georgia Counties Mostly and Consistently Followed Plans

Our results show a strong relationship between county comprehensive planning and county level job growth. Counties that have very innovative plans see a 27 percent decrease in jobs compared to other counties, respectively. These may be required to have innovative plans for a reason—they likely experienced negative job growth in the past, leading them to pass innovative comprehensive plans to catch up with more advanced counties so that they may grow and compete with counties that are already leading the way are to attempt to correct existing problems in the community. Counties experiencing negative job growth must implement innovative plans in an effort to attract more businesses and reverse the job growth trend. Another possible explanation may be that innovative counties are not interested in attracting businesses; they are innovative and anti-business development. An example in this type of planning behavior comes from Peachtree City, a community south of

Atlanta, who is one of the communities in the state leading the way with innovative planning and has miles of golf-cart paths around the city to ease road congestion. Peachtree City is not looking to attract big businesses to develop industrial parks—it is a community looking for a certain quality of life and is not worried about anything else.

Though there is debate over which comes first, our results suggest that population growth leads to an increase in jobs. An additional percent in population growth leads to a 0.37 percent increase in county jobs over five years' time. For an average county, a 10 percent increase in population between 1990 and 2000 will lead to 3.7 percent employment growth in the subsequent six year time period.

The last significant finding in the employment growth model is for industry mix from 1995-2000. As industry mix increases one unit, counties see an average of 5.9 percent job growth over the following six years; slightly more than one percent job growth per year. This means that as industries grow naturally, the county can expect to see significant job growth as a result. The average for county level industry mix growth is 3.71; the observed 5.9 percent increase in this model is significant for employment growth over the five year time period after implementation of the plan. Though this result is expected, it is not one counties should ignore—with the right planning and foresight, counties can attract growing industries and improve county level employment significantly.

Conclusion and Policy Recommendations

Using linear models, this thesis estimates the impact of county level comprehensive planning on regional economic development. The most compelling conclusion drawn from this study is the job growth experienced by counties who consistently follow their

comprehensive plan. This signals to state legislators and planners that what is assumed intuitively about planning is true—comprehensive planning positively impacts economic development. It also supports that the enactment of the Georgia Planning Act in 1989 was a beneficial decision for counties individually, which automatically benefits the state as a whole. As more counties follow their plans and implement appropriately thoughtful long-term visions for their communities, the state will see economic development improvements through increased job growth. Another expected finding in this study is the growth in employment in counties with minimal and average zoning standards; comprehensively zoned counties do not experience significant additional employment growth. Proposed explanations for this include businesses not wanting to locate in areas heavily zoned as there will be stricter guidelines for where they are allowed to open. Our results suggest average zoning standards are sufficient for county plans.

Controlling for various influences of employment growth and change in wages, our models attempt to estimate the relationship between planning and these independent variables. Surveying planning professionals around the state about the thoroughness, innovation, and implementation of county comprehensive plans allowed us to measure planning unlike we were able to find in any previous studies. To our knowledge, quantifying the impact of planning on economic growth, or any empirical measure for that matter, has yet to be done, allowing this study to lead the way in the literature. Our survey results were transformed into dummy variables, as we did not believe we could appropriately weigh each response to make the variables continuous. As a novice study in this field, ways to improve for future studies include investigating various weights for survey planning variables to allow a continuous right-hand model, allowing researchers to

see a more linear relationship. As in any study with first-hand data, a larger response rate is always encouraged. Though we account for location by using the USDA's Amenity index and a variable measuring each county's place on the Rural-Urban Continuum, an interesting model for future study and to consider spatial elements differently would be to conduct a Geographic Weighted Regression. Advantages of GWR include testing expected heterogeneity in coefficients as a spatial model and the fact that the entire ranges of estimates are considered, instead of averages, for local-level policy decisions (Partridge et al 2007).

With this empirical evidence, we support the Georgia Planning Act of 1989 and encourage all counties to consistently follow their comprehensive plan. It is also suggested for counties to pass at least moderate zoning standards so that they may see the largest benefits from their mandated plan.

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Appendix A.

Minimum Standards Chapter 110-12-1-.02

Plan Element	Required For	Recommended For
Community Goals	All Local Governments	
Needs and Opportunities	All Local Governments	
Community Work Programs	All Local Governments	
Capital Improvements Element	Governments that charge impact fees	
Economic Development Elements	Communities included in Georgia Job Tax Credit Tier 1	Communities Seeking improved economic opportunities for their citizens
Land Use Element	Communities with zoning or equivalent land development regulations that are subject to the Zoning Procedures Law	Communities that: • Are considering new land development regulations • Include target areas in their comprehensive plan • Wish to improve aesthetics of specific areas or protect parts of community
Transportation Element	Portions of Local government's jurisdiction that are included in a Metropolitan Planning Organization	Communities: • With automobile congestion problems in select areas • Interested in adding alternative transportation facilities for bicyclists, pedestrians, public transportation users • That have too much or too little parking in specific areas
Housing Element	HUD CBG Entitlement Communities required to have a Consolidated Plan	Communities with: • Concentrations of low-quality or dilapidated housing • Relatively high housing costs compared to individual/family incomes • A jobs-housing imbalance

Appendix B.

Georgia Counties Planning Survey

Please fill out this survey to the best of your ability for each of your region's counties. Many of the questions are asking in regards to the county's plan in the year 2000, please keep that in mind as you read and answer each question. The form is formatted so that you may fill out separate surveys for each county. You can do so by clicking the resubmit link after completing each survey.
Thank you for your time!

Please type the name of the respective county you are completing this survey for. _____

Please rate the county's zoning standards in 2000:
1. Nonexistent
2. Minimal
3. Average
4. Comprehensive

Please rate the thoroughness of the county's long range comprehensive plan in place in the year 2000:
1. Nonexistent
2. Minimal
3. Average
4. Comprehensive

How innovative was the plan in place in 2000?
Not at all
Innovative in a few places
More innovative than average
Very Innovative

How well did the county follow this plan over the decade 2000-2010?
Rarely
Some of the time, but rezoning is common
Most of the Time, but a few rezonings
Consistently
The county did not follow through with the plan and changed it sometime between 2000-2010

What percentage of the county's current plan has been implemented?
Don't know
Less than 10%
10-25%
25-50%
50-75%
75-90%
more than 90%

Does at least one (current) county planner have a degree in planning?
Yes
No
Not Sure

Appendix C.

Participating Counties:

Baldwin
Banks
Barrow
Bartow
Bibb
Bryan
Bulloch
Butts
Camden
Carroll
Catoosa
Chatham
Chattahoochee
Cherokee
Clarke
Clay
Clayton
Cobb
Coweta
Crisp
Dawson
DeKalb
Dooly
Douglas
Effingham
Floyd
Forsyth
Franklin
Fulton
Gilmer
Glynn
Gordon
Greene
Gwinnett
Habersham
Hall
Haralson
Harris
Hart
Heard
Henry
Houston
Jackson
Jones
Lamar
Liberty
Long
Lumpkin
Macon
Madison
Marion
McDuffie
McIntosh
Meriwether
Monroe
Morgan
Murray
Muscogee
Newton
Oconee
Oglethorpe
Paulding
Peach
Pickens
Pike
Polk
Pulaski
Putnam
Quitman
Rabun
Randolph
Richmond
Rockdale
Schley
Screven
Spalding
Stephens
Stewart
Sumter
Talbot
Taylor
Tift
Towns
Troup
Twiggs
Union
Upson
Walker
Walton
Washington
Webster
White
Whitfield
Wilkinson

Appendix D.

Summary Statistics

Variable	Mean	Std. Dev.	Min	Max
Percent Change Avg Weekly Wage	0.16	0.06	-0.02	0.31
Percent Change Avg Employment	0.07	0.16	-0.35	0.75
Thoroughness of 2000 Plan Rated: Minimal	0.28	0.45	0.00	1.00
Thoroughness of 2000 Plan Rated: Average	0.37	0.49	0.00	1.00
Thoroughness of 2000 Plan Rated: Comprehensive	0.35	0.48	0.00	1.00
Yes, County Planner has degree in planning	0.36	0.48	0.00	1.00
Zoning Standards of 2000 Plan Rated: Minimal	0.15	0.36	0.00	1.00
Zoning Standards of 2000 Plan Rated: Average	0.44	0.50	0.00	1.00
Zoning Standards of 2000 Plan Rated: Comprehensive	0.26	0.44	0.00	1.00
Some of Plan Followed over 2000-2010	0.28	0.45	0.00	1.00
Most of Plan Followed over 2000-2010	0.48	0.50	0.00	1.00
Plan Consistently Followed over 2000-2010	0.13	0.34	0.00	1.00
Plan Changed over decade 2000-2010	0.07	0.26	0.00	1.00
2000 Plan was Innovative in a Few Places	0.45	0.50	0.00	1.00
2000 Plan was Innovative more than average	0.34	0.48	0.00	1.00
2000 Plan was very innovative	0.04	0.20	0.00	1.00
Population Growth 1990-2000	0.27	0.24	-0.12	1.23
Rurality 1993	4.72	2.96	0.00	9.00
Median County Home Price	92376.60	27281.32	44000.00	184600.00
ln(price)	4.95	0.13	4.64	5.27
Percent County Population with High School Diploma	0.18	0.12	-0.22	0.36
Percent County Population with College Degree	0.16	0.08	0.05	0.41
Amenity Index	3.60	0.61	3.00	5.00
Distance to MSA (km)	38.43	21.94	0.00	86.32
Distance to City with 1/2 million population	112.40	53.41	3.79	249.46
Industry Mix Growth over 1995-2000	3.71	2.19	0.00	10.59