State Growth Management Programs and Central-City Revitalization

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During the latter part of the 20th century, many U.S. state governments adopted growth management programs for the purpose of establishing a more proactive role in the regulation of land use. Although many scholars have recently begun to critically examine the implementation of these new state initiatives, few have explored their effects on patterns of intraurban land development. In this article, we develop a framework for thinking about the likely effects of state growth management programs on a central city's ability to attract new residential construction activity and investigate this issue using a panel data approach. Multivariate regression results suggest that these programs have observable effects on the spatial distribution of residential construction activity within urban areas. Furthermore, we accept several hypotheses regarding coefficient stability across states, regions, and program designs. These findings suggest that state growth management programs may be an effective tool for promoting the revitalization of central cities.

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During the last century, many U.S. state governments began to take an expanded role in the regulation of land use. In response to the increased public demand for environmental protection legislation and out of a desire to ensure consistent implementation of state policies, political leaders in several states have supplemented or completely replaced their local planning and zoning-enabling statutes with state growth management laws. Although *growth management* has come to mean many different things to different people, common to all state-level growth management programs is an emphasis on coordinating land use planning activities across a wide range of local, regional, and state actors to achieve more efficient, well managed, and compact urban growth patterns.

Urban scholars have recently begun to critically examine the implementation of these new state initiatives (see, e.g., Bollens, 1992; Deyle & Smith, 1998; Gale, 1992; Nelson & Moore, 1996; Weitz, 1999b). Most existing studies have tended to focus on description, categorization, and historical analysis of individual state programs. So far, we know little about the impacts of state growth management programs on urban development patterns. The only existing nationwide study to examine the land market impacts of state land use controls is Shilling et al. (1991). Using state-level data from the mid 1970s, the authors of that study found a positive relationship between state land use controls and the demand for residential land. While useful, the study did not examine the spatial impacts of state land use controls. Also, the data it examined came from a 2-year period prior to the adoption of most state growth management programs. A more recent study by Carruthers (2002) examined urban development trends within 283 metropolitan counties and found that the length of time that a state growth management program had been in place was significantly associated with different dimensions of urban sprawl, including population density, the extent of urbanized land area, and property values. Although it provides valuable information about the intracounty urban development impacts of state growth management programs, this study did not examine the spatial pattern of urban development between counties, and it focused on counties in only 14 states.

We seek to increase understanding of the land market impacts of state growth management programs. These state initiatives can be distinguished from other state-level land use reforms by an emphasis on redirecting the pattern of new growth and investment away from the urban fringe toward existing urban areas. If state growth management programs have been successful in shifting new growth and investment inward toward the urban core, then these programs stand to be powerful policy tools for central-city mayors and national urban policymakers interested in promoting the revitalization of lagging and abandoned central city areas. By steering land developers away from suburban areas toward more central locations in their search for developable land, state growth management programs offer a unique approach to central-city revitalization that is potentially more comprehensive and effective than isolated efforts by central cities to compete with fiscally-endowed suburban governments for increased shares of a region's new growth.

In this article, we evaluate the effectiveness of state growth management programs in steering new growth away from the suburbs toward the central city, using a unique panel data set that combines metropolitan-level building permit data from 1980 through 1998 with data from the U.S. Census of Population and Housing. The purpose of the investigation is to determine if the presence of a state growth management program has had a significant impact on the share of new metropolitan residential construction attracted to primary central cities. We also examine the impact of program design to determine if variations in the type of state growth management program or the regional context have had an impact on the sign, magnitude, or direction of the state growth management effect.

Background

State Growth Management and Central-City Revitalization

Since the 1920s, central cities have been slowly losing population and employment to surrounding suburban areas. This trend became prominent during the years after World War II, as rising incomes and federal homeownership policy made the American dream of a home in the suburbs possible for the majority of the middle class. Between 1948 and 1990, the U.S. metropolitan-area population living in central cities declined from 64% to 39%. Trends in central-city employment have been similar. Between 1948 and 1990, the central city's share of manufacturing employment declined from 67% to 45% (O'Sullivan, 2000). Although some studies point to hidden trends of in-migration from suburban areas to central cities among certain demographic groups (Spain, 1989), aggregate trends still suggest that outward population migration overshadows this "back to the city" movement (Kasarda et al., 1997).

The depopulation of and disinvestment in central cities has been linked to a variety of social problems. Given evidence which suggests that the average suburban in-migrant tends to be from a White, middle- to upper-income household, central-city population loss often signals a decline in the central city's tax base and an increase in metropolitan-level racial segregation. Furthermore, since many firms have followed their workers to the suburbs, population decentralization is often associated with job decentralization and a loss of employment opportunities for central-city residents. This decentralization of jobs and households, combined with the racial discrimination and exclusionary zoning found in many suburban areas, has resulted in U.S. metropolitan areas that are highly balkanized with respect to race, income, and employment opportunities (Downs, 1999; Kain, 1993; Massey & Denton, 1993).

Policy Responses

In response to these trends, central-city mayors and national urban policy experts have proposed a variety of measures designed to increase the relative attractiveness of the central city as a residential location in the hopes of drawing more middle- to upper-income households back. Investments in central-city public amenities and facilities, tax and financing incentives offered to private-sector developers, and comprehensive land acquisition and reassembly programs have all been used by practically every major U.S. city at one time or another during the last century to attract residents and employers.

In addition to policies aimed at improving the central city's regional competitiveness, local, regional, and state growth management programs have been used that offer a regional solution to central-city revitalization by redirecting the pattern of new growth and development towards existing urban areas. To date, most studies examining the economic effects of growth management programs, with the exception of Shilling et al. (1991) and Carruthers (2002), have focused on the land and housing price effects of *local* growth management programs. Although land prices within urban areas often increase following the enactment of local growth management programs, most speculate that this effect is probably the result of constrained urban land supplies rather than increases in the demand for urban land (Fischel, 1989).

For several reasons, many argue that state-level growth management programs stand to be more effective instruments for promoting central-city revitalization than the uncoordinated adoption of local growth management programs (see, e.g., Knaap & Nelson, 1992). First, a state's planning jurisdiction usually extends well beyond a single regional land market. Whereas local growth management programs enacted at the subregional level may push new growth to an unregulated portion of the region (Downs, 1999), state-level growth management programs facilitate coordinated land use policies across an entire land market. Second, many state growth management programs include requirements to increase urban land supplies to absorb the additional growth being redirected towards urban areas. Oregon and New Jersey currently supplement their state growth management programs with extensive affordable housing requirements to which local governments must adhere.

Finally, local policymakers in states with these programs must adhere to state-level requirements for consistent application of a single urban development policy. All state growth management programs rely on one or more types of intergovernmental policy consistency requirements to implement state growth management goals. Burby et al. (1997) identified three different types of consistency requirements. *Vertical consistency* refers to the connection between local planning efforts and state land use policy goals. Without this requirement, local governments may be reluctant to promote state goals, especially if these goals are inconsistent with the goals of local political interests. *Horizontal consistency* refers to consistency across local jurisdictional boundaries. This form of policy consistency attempts to directly address the tendency among local governments to engage in "beggar-thy-neighbor" policies that benefit local interests at the expense of neighboring jurisdictions. The final type of consistency, usually referred to as *internal consistency*, refers to the level of consistency between local land use decisions or policies and the local comprehensive plan. This type of consistency is necessary to ensure that plans are actually used in the local decision-making process.

Centralization of Land Use Policy

In addition to improving the state's ability to effectively monitor compliance with state land use policy goals, the centralization of land use policy at the state level through state-level growth management programs may also indirectly promote compact growth patterns by altering the dynamics of local land use policymaking. Lewis (1996) argued that the pattern of development within a metropolitan region is "structured" by patterns of local land use authority. In regions where local governments wield substantial authority over local land use decisions, individual neighborhoods wield substantial political power, so much so that only marginal changes in existing land use patterns will be tolerated by residents. Since local elected officials are assumed to be highly responsive to these local political demands, politicians seek to preserve existing residential development patterns. The implication here is that during regional growth spurts, new development will be forced to the periphery of the urban area where existing residents are not as likely to erect barriers to land use change.

Lewis (1996) contrasts this decision-making pattern with that found in "unitary" regions, where land use decisions are made by a single regional governing authority. The centralization of land use decision-making authority gives an outlet to regional issues with no previous political voice. According to Lewis (1996), in these unitary regions,

> [a] different scheme of preference aggregation, internal to a single political system, is at work. Localized opposition to certain land uses may be overwhelmed by a more widespread, if less intense, preference for other goals in the rest of the city: economic vitality, for example, or regional transportation mobility, or an equalization of living conditions. Such regional issues as job creation and transportation problems will now have a political outlet. (p. 34)

By restructuring regional political decision making, centralized land use regimes increase the local political benefits of cooperating to resolve regional problems by providing a forum to address extralocal issues such as regional traffic congestion, environmental degradation, and interjurisdictional fiscal disparities. If these regional issues are sufficiently salient, the incentives to cooperate for regional policy may override the antigrowth sentiments of well established, in-town neighborhood groups.

Regardless of whether changes in regional land use policy result from the enforcement of state compact growth policies or from the restructuring of regional land use decision making, effective state growth management programs should ultimately affect land development outcomes by changing the location of available land development opportunities within the region. If state compact growth policies are consistently applied across an entire urban land market, then the future land development potential of fringe urban areas becomes limited in the short run. Foreseeing fewer opportunities in the suburbs or the exurbs, land developers should begin to look inward for new investment opportunities, thus increasing the share of new construction occurring within central-city boundaries.

Data Description and Variable Operationalization

The data used for this study is a panel dataset composed of 19 time periods (1980 through 1998) on each of 293 metropolitan statistical area (MSA) cross sections. We rely on the 1998 U.S. Census Bureau definition to delineate metropolitan areas but include in the dataset only those MSAs that were defined as metropolitan areas as of 1980. For the dependent variable (discussed below), we have unique annual observations for each MSA and each year. For the independent variables, we employ census variables that are provided only in 10-year increments. To obtain estimated values of the control variables for all years between decennial census years, we employed a linear interpolation procedure to estimate values for years for which data were not available.

By "pooling" the variables across time and across cross-sectional units, we can obtain more precise estimates of the intertemporal impacts of individual statewide comprehensive planning mandates. The additional observations on each MSA increase the number of data points, thereby improving the efficiency of regression parameter estimates by reducing the multicollinearity among independent variables (Hsiao, 1986). More importantly, our data allow us to control explicitly for unobserved heterogeneity resulting from MSA-specific fixed effects. By including MSA fixed effects in the regression model, measured using dummy variables for each MSA, we control for the average of all metropolitan area influences on central-city revitalization that stem from differences in regional amenities, climates, and unobserved local perceptions of central-city quality of life (Baltagi, 1995; Greene, 2000; Hsiao, 1986; Stimson, 1985). Our diagnostic tests indicate that these MSA-specific effects are significant in our model and that omitting these effects from the regression would bias the estimated coefficients on those variables that are correlated with these effects.[1]

Defining and Measuring Central-City Revitalization

What exactly is central-city revitalization and how do we recognize it when we see it? Unfortunately, defining and measuring central-city revitalization is no easy task, due to the ambiguity in the literature surrounding the terms *central city* and *revitalization*. To simplify the analysis, we follow the U.S. Census Bureau's (1994) definition of a central city: an incorporated political unit that captures the largest share of a region's commuting flows and houses the majority of the region's population, with the greatest weight given to the latter factor. In many metropolitan areas, the Census Bureau also defines additional central cities that include large shares of regional employment and population. In regions with more than one central city, we focus only on the primary or largest central city in our analysis, because these additional central cities are more likely to include newer, suburban "edge cities" (Garreau, 1991). Any measure of central-city revitalization that includes both core central cities and edge cities would likely overstate the level of new investment in the region's primary core central city.

We readily acknowledge the limitations of relying on the Census Bureau's definition of a central city. For example, this definition ignores many subtleties commonly discussed in the revitalization literature, such as the distinction between downtown (or central business district) revitalization and inner-ring (or first-tier suburb) revitalization. Furthermore, our definition does not allow us to examine revitalization in areas outside central cities but within larger urban growth areas or urban growth boundaries. However, since our analysis requires that we employ a definition that facilitates consistent data collection across time and across metropolitan areas, we opt for the simpler Census Bureau definition and invite others to extend our analysis to areas *within* central-city and suburban jurisdictions in future research.

We consider revitalization, broadly defined, to be a process of reinvestment in central-city infrastructure. This infrastructure includes both the physical and human capital that make central cities vibrant places to live, visit, and conduct business. Unfortunately, investments in human capital are very difficult to observe. We usually observe only the *outcomes* of human capital investments in the form of reduced crime, more productive workers, and higher per capita incomes. Rather than rely on imperfect proxies for human capital, we instead focus on investments in the central city's physical built environment, and in particular, the central city's stock of new housing.

Housing is an important dimension of the physical built environment, because it occupies the largest percentage of all land uses in most urban areas. By focusing on housing investments, we also capture a component of the unobserved human capital dimension of central-city revitalization, because high-quality housing may produce external human-capital benefits in the form of increased worker productivity and civic engagement. Furthermore, since residential construction activity is both an indicator of likely future population trends and an early indicator of the health of the local economy, it provides a robust measure of the private sector's commitment to central-city reinvestment, our primary goal in this analysis.

Although we acknowledge that state growth management policies may affect the markets for many different types of land uses, changes in local regulatory programs resulting from state growth management laws are likely to have the strongest effect in the market for new *residential* uses. Policies such as minimum-density zoning, inclusionary zoning, and other techniques of increasing density within urban areas often operate through changes to housing density standards rather than through changes to commercial land use regulations. Although we do not examine the impact of state growth management on the supply of commercial uses in this study, we invite others to investigate this issue in future research.

Our chosen measure of central-city housing investment is the primary central city's share of new residential building permits within a 1998 U.S. Census Bureau-defined MSA or PMSA for a given year. There are several reasons for relying on this measure. First, the Census of Construction calculates building permit data monthly, so it provides a larger number of data observations than the decennial Census of Population and Housing. Second, to test our hypotheses presented in the previous section, we need a measure of the supply-side response of land developers to changes in state growth management policies. Other measures of land use change, such as housing prices or population movements, measure only the decisions of homeowners or households and not the supply-side decisions of housing producers. Finally, using central-city shares of total metropolitan residential construction activity allows us to compare aggregate shifts in land development activity across U.S. regions by means of a consistent metric, a crucial task for this analysis.

Which States Have Growth Management Programs?

This study defines state growth management programs as those state initiatives that meet two criteria: (1) the enacting legislation mentions the goal of promoting compact development patterns or reducing urban sprawl, and (2) the program relies on at least one of the aforementioned forms of consistency to implement state policy goals.[2] Some may object to our including in the list states without vertical consistency requirements.[3] We include these states, provided they have a state policy that defines compact growth objectives, because doing so allows us to distinguish between the effects of "top-down" and "bottom-up" approaches to state policy implementation. Top-down state growth management programs rely on state mandates and state planning agency oversight and approval of local plans to ensure that local governments adopt plans that are consistent with state planning objectives. Bottom-up programs, such as those in Washington, Vermont, and New Jersey, rely instead on local capacity-building strategies and other incentive-based programs to implement state growth management objectives but do not review local plans for consistency with state plans and policies (Porter, 1993). The most extreme version of the bottom-up approach to implementation can be seen in Washington, where state transportation plans are required to be consistent with local plans, rather than the reverse.

Some may also question the inclusion of states with horizontal consistency. We argue that a horizontal consistency requirement may act as a substitute for a vertical consistency requirement. Even if there is no vertical consistency requirement, a state can still require that the plans of all adjacent jurisdictions in a metropolitan area be consistent with one another in the implementation of regional growth management objectives. Without a horizontal consistency requirement, the pursuit of regional compact growth objectives may be compromised by adjacent jurisdictions that fail to adopt plans that accommodate their share of the region's new growth. If only one jurisdiction adopts a policy to restrict all new growth, for example, then that jurisdiction's share of new growth will merely be shifted to another jurisdiction in the region. Horizontal consistency requirements help to ensure that all local governments within a given region adopt plans that accommodate local shares of regional growth.

All states meeting our criteria are listed in Table 1, along with the name and year of the enacting legislation and the type of consistency requirement used to implement state growth management goals.[4] Although scholars regularly disagree over which states should be included in such a list (see Weitz, 1999a, for a discussion), our criteria capture the dimensions of state growth management that are most likely to have an impact on central city revitalization, based on the discussion in the previous section.

Analysis

Since state growth management programs ultimately affect the urban land market through their impact on local land use policies, we should expect any short-term impacts to be only temporary responses by

TABLE 1. U.S. states with statewide growth management programs.

State	Legislation	Date of adoption	Consistency requirements[a]
Florida	Local Government Comprehensive Planning and Land Development Regulation Act, State Comprehensive Plan	1985	V, H, I
Maine	Comprehensive Planning and Land Use Management Act	1988	V, H, I
Maryland	Economic Growth, Resource Protection, and Planning Act	1992	V, I
New Jersey	State Planning Act	1986	I
Oregon	Land Conservation and Development Act	1973	V, I
Rhode Island	Comprehensive Planning and Land Use Regulation Act	1988	V, H, I
Vermont	Growth Management Act	1988	H, I
Washington	Growth Management Act	1990	H, I

Sources: Bollens (1992), Burby et al. (1993), Degrove & Miness (1992), Gale (1992), Institute for Business and Home Safety (1998), Weitz (1999a)

a. V = vertical consistency; H = horizontal consistency; I = internal consistency

local developers to perceived changes in the regulatory environment. Here, we are more interested in examining the long-term impacts that result from the actual implementation of state land use policy and gaining a complete picture of the dynamic nature of the state growth management effect. Since many state growth management programs are fairly young, it would be inappropriate to simply compare differences between mean residential construction shares of states with growth management programs and those without. One approach might be to examine how the mean level of a central city's share of residential construction permits varies with the duration of the state's growth management program. We examined a graph of this sort and observed a positive trend over time, but the usefulness of this graph was limited due to the relative immaturity of most state growth management programs.

Comparing Trends

To get an idea of how comparable metropolitan areas in states with and without growth management programs have fared over the last two decades, we begin by examining trends within a few metropolitan areas. The purpose of this analysis is not to draw definitive conclusions but to illustrate comparative trends across metropolitan areas that are similar except for the presence or absence of a state growth management policy. Figure 1 displays trends in primary central-city shares of residential construction permits from two metropolitan areas without state growth management policies (Fayetteville, Arkansas, and Green Bay, Wisconsin) and three metropolitan areas with state growth management policies (Yakima, Washington; Eugene, Oregon; and Tallahassee, Florida). These metropolitan areas were chosen because they all have similar 1990 population levels (from 188,823 in Yakima to 210,908 in Fayetteville). The mean share for primary central cities for the entire U.S. is also shown for comparison.

As this graph indicates, primary central cities in the U.S. have, on average, been steadily losing shares of MSA new residential construction since the 1980s. This trend is striking in Fayetteville and Green Bay, located in states without growth management policies. Fayetteville's share of new residential construction declined from 43% in 1980 to 16% in 1998. In Green Bay, this decline was even greater: from 67% in 1980 to 18% in 1998, after reaching a two-decade low of 17% in 1997.

Trends are somewhat different for the three metropolitan areas in states with growth management policies (denoted with bold lines). Eugene has been gaining shares of new metropolitan construction activity from 43% in 1980 to to 65% in 1998. Even more interesting are Tallahassee and Yakima, which both gained substantial shares of new residential construction in the year immediately following the adoption of state growth management programs. In 1986, the year following the adoption of Florida's Local Government Comprehensive Planning and Land Development Regulation Act and State Comprehensive Plan, Tallahassee's share of new construction jumped from 33% to 50% and has remained above 48% ever since. In 1991, the year following the adoption of Washington's Growth Management Act, Yakima increased its share of MSA construction activity from 21% to 45%. Although Yakima's share declined

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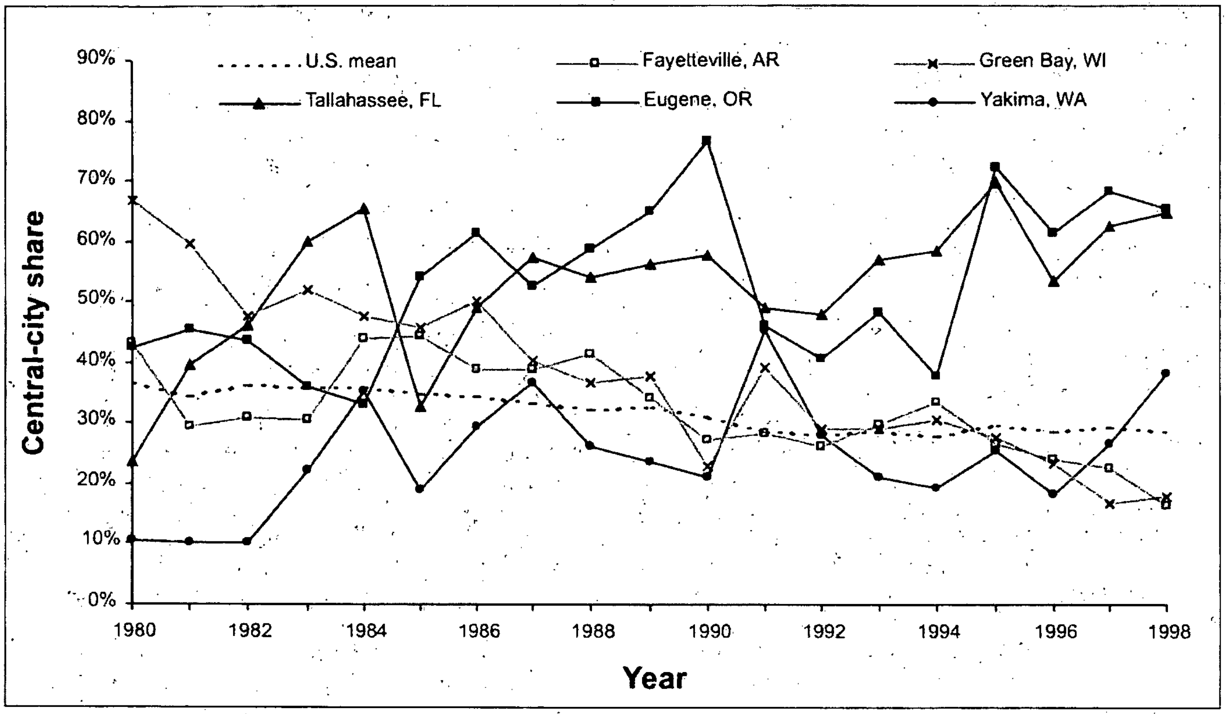

FIGURE 1. Central-city shares of MSA residential construction permits, 1980–1998.

somewhat during the 1990s, it began to increase dramatically near the end of that decade.

While interesting, Figure 1 displays construction trends within only five metropolitan areas. To obtain a more precise estimate of the effects of state growth management programs, it is necessary to examine trends within a larger number of metropolitan areas.

Multiple Regression Model Specification

We now examine the marginal impact of state growth management programs over time, controlling for other determinants of central-city shares of MSA residential construction permits, especially the unobservable effects that are unique to each metropolitan area. We adopt a panel data multiple regression approach to accomplish this task. While this approach is somewhat limited in that it provides only an estimate of average national trends over time, controlling for other factors, we feel that this approach is the optimal way to take advantage of the rich temporal and cross-sectional variability in our data. By isolating the impacts of temporal and metro-specific effects, and by controlling for other determinants of construction activity, regression analysis using panel data methods provides an advantage over traditional regression techniques that focus on only one dimension. This method also captures more complicated multivariate relationships that may lie hidden behind simple descriptive statistics.

The dependent variable for our regression model is the share of new residential building permits (SHRES) attracted by the primary central city in MSA *i* during time *t*.[5] SHRES is modeled as a simple linear function of MSA fixed effects and nine independent variables, all of which vary by time and by MSA: primary central-city land area in year *t* divided by primary central-city land area in year *t*-10, with *t* = 1980 and 1990 (ANNEX); the primary central city's share of MSA inflation-adjusted per capita income (SHINC); the primary central city's share of MSA density (SHDEN); the percentage of primary central-city population defined as African American divided by the percentage of MSA population defined as African American (SHBL); the share of total MSA population residing within the central city (SHPOP); the total MSA population (MSAPOP); the central city's share of the total supply of existing MSA residential units at the beginning of time *t* (SHXUNIT); a

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trend variable measured from 1 to 19 (YEAR); and the number of years that a state growth management program has been in place in MSA *i* at time *t* (GMYR). Data sources and descriptive statistics for all variables are listed in the Appendix in Tables A-1 and A-2.

The estimated empirical model can be interpreted as a reduced-form aggregate housing investment equation that models primary central-city shares of new metropolitan housing investment as a function of relative price and cost-shifting variables. The empirical equation is presented here, with the hypothesized signs included:

$$SHRES_{it} = \beta_{1i} + \beta_2(ANNEX_{it}) + \beta_3(SHINC_{it}) - \beta_4(SHDEN_{it}) - \beta_5(SHBL_{it}) + \beta_6(SHPOP_{it}) + \beta_7(MSAPOP_{it}) \pm \beta_8(SHXUNIT_{it}) - \beta_9(YEAR_t) + \beta_{10}(GMYR_{it}) + e_{it}$$

The hypothesized signs of the coefficients are drawn from previous empirical and theoretical studies. ANNEX is a measure of the primary central city's ability to annex land over time. According to Rusk (1993), central cities with the ability to annex land to increase land supply should be more effective at capturing a larger share of the region's new growth. SHINC is a demand-side variable that captures the effect of intraurban shifts in per capita income. SHBL captures any intraurban shifts in housing demand attributable to preferences for racially homogenous neighborhoods. A study by Mills and Price (1984) found this measure to be the only significant and consistent predictor of U.S. suburbanization. Together, MSAPOP and SHPOP control for the relative attractiveness of each MSA and each central city as a place of residence. By controlling for the central city's previous success in attracting relative share of population, SHPOP is also a proxy for relative differences in existing levels of urban decline across metropolitan areas.[6] SHXUNIT is a measure of the primary central-city's share of the existing MSA housing stock. After controlling for land availability in the central city, this variable captures the size of the central-city housing market relative to the region. In MSAs where the central city has jurisdiction over a very large share of the regional land market, we would expect central-city shares of new development to be higher than in those regions where the central city's share of the housing market is rather small. Since this variable may also capture the lagged response of new development to existing housing shortages within the central city, the sign of the coefficient on this variable is indeterminate. SHDEN is a measure of the availability (and hence the cost) of central-city land relative to that of the MSA. During the time period under investigation, suburban housing construction has increased nationwide due to the ubiquity of new suburban employment centers, or edge cities (Garreau, 1991). YEAR controls for this time trend across MSAs.

We chose to model the effect of state growth management programs using a time-series variable indicating the duration of time that the state growth management program has been in place (GMYR). Based on the analysis above, the impact of the growth management program should vary over time, thus a simple dummy variable indicating the presence of a state growth management program would understate the dynamic importance of the state growth management program.[7] To capture this dynamic effect, we assume that the effect of the state growth management program is linear and measure temporal effects with a variable defined as "1" the year following the adoption of the state growth management program and "2," "3," "4," etc. for each following year. A test of the state growth management program's impact on central-city revitalization (as measured by new residential building permit activity) is a test of whether β_{10} is greater than zero.

The approach taken to obtain consistent and efficient estimates of the regression parameters is a fixed-effects model with dummy variables for each MSA cross section.[8] Initial tests on models using traditional ordinary least squares (OLS) estimation procedures indicated the presence of autocorrelation, so all results shown below refer to autocorrelation-corrected models using a feasible generalized least squares (FGLS) AR(1)-correction procedure as suggested by Prais-Winsten (1954), with a single value of RHO for all observations, as suggested by Beck and Katz (1995).[9] Following Beck and Katz (1995), we also report robust panel-corrected standard errors (PCSEs), which are robust in the face of heteroskedasticity and contemporaneous correlation and provide more accurate estimates of the regression parameters' standard errors.[10]

Regression Results

We now turn to the regression results from the AR(1) models. The estimated coefficients, significance levels, and model diagnostics for the initial residential construction permit share model are shown in Table 2.[11] Standardized coefficients are reported to facilitate comparisons among independent variables, many of which are measured in different units. We report results from two regressions, one with and one without controls for MSA fixed effects. The reader is also reminded that in an AR(1) regression using a generalized least squares approach, all variables are transformed into first differences over one time period within each cross section, weighted by the estimated autocorrelation parameter.

The model diagnostics indicate that the fixed-effects model is most appropriate for our data.[12] The AR(1)

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TABLE 2. Factors affecting the primary central-city share of MSA residential construction activity.

Explanatory variables	Standardized regression coefficients: AR(1) model without fixed effects	Standardized regression coefficients: AR(1) model with fixed effects
MSA controls		
Annexation, 1980, 1990	0.038***	0.021**
MSA population, 1980–1998	−0.056***	0.240***
Central-city share of MSA population, 1980–1998	0.750***	0.376***
Central-city share of MSA population density, 1980–1998	0.053**	−0.104**
Central-city share of MSA African American population, 1980–1998	−0.031	0.006
Central-city share of existing housing units, 1980–1998	−0.059	0.278***
Central-city share of MSA per capita income, 1980–1998	0.166***	−0.028
Year, 1980–1998	−0.051**	−0.110***
State growth management[a]	0.006	0.055***
Summary statistics		
N	5,567	5,567
F-statistic[b]		4.846***
Buse raw-moment R^2	0.502	0.905
Durbin-Watson statistic	2.323	1.912

Note: Fixed-effects coefficient values not reported here for brevity. Panel-corrected standard errors are used to calculate significance levels.

a. Variable equal to the number of years since adoption of a state growth management legislation.
b. F-test for the restriction that fixed effects are jointly equal to zero.
* $p < .10$; ** $p < .05$; *** $p < .01$

model effectively removes any residual serial correlation, with a value of RHO that is approximately 0 (not reported) and a value of the Durbin-Watson statistic that is close to 2. The F-statistic reported in the second column tests for the joint significance of the fixed-effects coefficients. This statistic is highly significant, which suggests that omitting these controls from the model would bias any remaining parameter estimates that are correlated with these effects. The significance of these effects also suggests that average shares of central-city housing construction are heterogeneous across metropolitan areas. Finally, the large Buse raw-moment R-squared[13] of .905 provides further evidence that the AR(1) fixed-effects model provides a good fit to the data.

Due to the significance of the MSA fixed effects and the correlation between these effects and our explanatory variables, several variables change in sign and significance once the fixed effects are introduced into the regression. The relative density of the central city takes on its expected sign once we control for fixed effects. This suggests that land availability in the central city may serve as a constraint for future growth. The positive influence of annexation on housing construction also supports this conclusion.

Interestingly, relative central-city shares of income are no longer significant once we control for fixed effects. The insignificance of the income share variable suggests that MSA fixed effects capture much of the demand-side information that determines central-city housing prices. In particular, these fixed effects may be capturing the intangible "quality of life" dimension of cities that analysts often find so difficult to quantify, particularly those having to do with the city's proximity to natural amenities such as beaches and riverfronts.

Whereas Mills and Price (1984) found evidence in favor of significant "White flight," we find no evidence in our more recent data that the suburban share of new housing construction is affected by the central-city share of African American population. Even after we control for MSA fixed effects, a central city's relative share of the MSA African American population does not have a significant effect on its level of central-city housing construction.

One of the more interesting findings is that the share of population contributes most to the central city's ability to capture new metropolitan residential construction activity. Furthermore, with controls for fixed effects, a central city's share of the MSA population is relatively more important than the total population of the MSA. A glance at the fixed-effects coefficients provides additional insights into these findings.

Table 3 displays the standardized fixed-effect coefficient values for the 50 MSAs with the most statistically significant fixed-effect estimates. The table ranks these 50 metro areas by the value of the coefficient. These fixed-effects coefficients can be interpreted as a regression constant that is specific to each MSA. Thus, they capture the average of all unobservable characteristics that affect the central city's share of construction.

Two things are immediately apparent from this table. First, there seems to be an inverse relationship between the population size and/or age of the MSA and the central city's share of construction. Larger, older industrial cities such as Detroit, Trenton, and Chicago have been losing new construction relative to smaller, newer Sunbelt cities. Another apparent trend is the regional variation in the data. Cities in northern regions seem to be losing construction relative to cities in the South and in California. Since climate alone is not likely to affect a city's attractiveness relative to the surrounding MSA, these fixed effects are likely capturing interregional population shifts from the Rustbelt toward the Sunbelt. It may be the case that urbanites leaving older industrial central cities migrate to the South and the West but still desire the urban amenities found in the cities they left behind.

As for the impact of state growth management programs, our results suggest that the relative magnitude is similar to but somewhat larger than the impact of central-city annexation. This marginally larger impact likely results from the fact that these programs reshape the pattern of developable land supply for an entire region, whereas annexation affects land availability only for areas inside the central city's jurisdiction. As the results in Table 2 indicate, the impact of both central-city annexation and state growth management program duration on the central city's share of construction is highly significant. Furthermore, the state growth management effect appears only after controlling for metropolitan-specific factors.

This is an expected finding. Both policies expand the land area available for central-city housing construction, but each works in a slightly different manner. Annexation facilitates outward expansion of central-city borders, whereas state growth management programs are designed to limit suburban and exurban construction opportunities relative to the central city through the use of infill development incentives and rural land preserva-

TABLE 3. Fixed-effects coefficients for the 50 MSAs with the most significant fixed-effects estimates.

MSA	Standardized fixed effect
Chicago, IL	−0.139***
Los Angeles-Long Beach, CA	−0.114***
Philadelphia, PA-NJ	−0.103***
Detroit, MI	−0.085***
Houston, TX	−0.076**
Boston, MA	−0.074**
Baltimore, MD	−0.071***
Milwaukee-Waukesha, WI	−0.067**
Washington, DC-MD-VA-WV	−0.064**
Racine, WI	−0.059*
Portland-Vancouver, OR-WA	−0.057*
Cleveland-Lorain-Elyria, OH	−0.052**
Trenton, NJ	−0.045**
Atlanta, GA	−0.043*
St. Louis, MO-IL	−0.041*
Orange County, CA	−0.032*
Salinas, CA	0.043*
Las Vegas, NV-AZ	0.049*
Yuba City, CA	0.052*
Chico-Paradise, CA	0.055**
Visalia-Tulare-Porterville, CA	0.056*
Bakersfield, CA	0.056*
Augusta-Aiken, GA-SC	0.060***
Sherman-Denison, TX	0.060*
Yolo, CA	0.064**
Redding, CA	0.060*
Bismarck, ND	0.064*
Alexandria, LA	0.064*
Killeen-Temple, TX	0.071***
Tuscaloosa, AL	0.074**
Longview-Marshall, TX	0.075**
Athens, GA	0.075***
Tyler, TX	0.076**
Fargo-Moorhead, ND-MN	0.079**
Joplin, MO	0.079**
Flagstaff, AZ-UT	0.084***
Greenville, NC	0.084**
Jonesboro, AR	0.086**
Billings, MT	0.088**
Dothan, AL	0.089***
Grand Forks, ND-MN	0.091***
Hattiesburg, MS	0.092***
Missoula, MT	0.108***
Decatur, AL	0.108***
Clarksville-Hopkinsville, TN-KY	0.108***
Santa Fe, NM	0.115***
Great Falls, MT	0.117***
Florence, AL	0.117***
Casper, WY	0.121***
Sumter, SC	0.139***

* $p < .10$; ** $p < .05$; *** $p < .01$

tion initiatives. This combination of incentives and restrictions likely motivates developers to look inward rather than outward for developable land. Furthermore, if developers expect that a state growth management program will be implemented over the long run, it is not unreasonable to expect an immediate response by forward-looking developers, due to their rational expectation of future limitations on suburban land availability.

It is also possible that state growth management programs have exerted a demand-side effect on the central-city housing market through improvements in the quality of central-city infrastructure and other "quality of life" enhancements. We are unable to separate these effects in our analysis, but it is reasonable to expect that short-term effects are more likely due to supply shocks resulting from housing producers readjusting to new land market supplies. Since the amenities resulting from state growth management take time to plan and create, demand-side effects are more likely to emerge in the long run, thus further justifying our emphasis on the temporal dimension of growth management policy implementation.

The unstandardized regression coefficient for the state growth management program duration variable (not reported) is .0054. This suggests that a central city will stand to increase its share of metropolitan residential construction activity by .54 percentage points per year if a state growth management program is put into place. In other words, within a metropolitan area that issues 10,000 building permits per year, a state growth management program may redirect 54 new housing units back toward the primary central city in the year following the adoption of the state growth management program. By the 10th year, 540 additional housing units will have been "recaptured" by the central city. Clearly, this effect will vary across metropolitan areas due to the differences in relative central-city population shares and the relative "elasticity" of central-city boundaries. Our estimate should be interpreted as the marginal effect of having a state growth management program in place, holding all other factors constant.

Tests for Structural Change

One potential problem with comparing the impact of state-specific policies over many metropolitan areas in many different regions is that the estimate of the impact may actually be reflecting some weighted average of the impacts across different regions, states, or implementation styles. Thus, the GMYR coefficient may be inherently unstable. To test for this possibility, we modified the test proposed by Chow (1960) to test four restrictions. The results are presented in Table 4.

Each test requires a comparison of an "unrestricted" model that allows the state growth management coefficients to vary across geographic regions and/or policy types (Models 2–5) with a "restricted" model that assumes equal state growth management coefficients across geographic regions and/or policy types (Model 1). The four restrictions are as follows:

1. The marginal impact of state growth management programs in the Northeast is equal to the marginal impact of state growth management programs in the remainder of the U.S. (Model 2). Since cities in the northeastern U.S. have had a more significant history of urban decline since World War II than those in other regions, state growth management programs in this region may not be as effective in channeling growth towards the central city, especially if the program acts only to redirect regional land supplies rather than to foster demand-side improvements in central-city quality of life.

2. The impact of a state growth management program on central-city residential construction may be stronger in central cities that are already attractive to residents and where a large proportion of the MSA population already resides. If this is the case, then we can test for the equality of the state growth management coefficients across centralized MSAs (defined as those MSAs where more than half of the regional population resides in the central city) and decentralized MSAs (all other MSAs; Model 3).

3. State growth management programs vary significantly from state to state. Based on our earlier argument, we tested the restriction that the state growth management coefficient is equal across states with different forms of consistency requirements (Model 4).[14] We define those with all forms of consistency requirements in place *comprehensive* states. *Vertical* states are those that lack horizontal consistency requirements. Finally, *horizontal* states are those that lack vertical consistency requirements. Since virtually all states included in our analysis have some form of internal consistency requirement in place, we are not able to examine variation along this dimension.

4. Finally, variations in the state growth management effect may be state specific. To examine this possibility, we tested the restriction that the state growth management coefficient is equal across all states with growth management programs (Model 5).

While there seems to be significant variation in the policy variable across many dimensions, none of these

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TABLE 4. Chow tests for structural change in effects of state growth management programs.

Regression specification	GMYR coefficient	Standard error	SSE[a]	DF[b]	F-stat
Model 1					
Restricted variations	0.005	0.001***	40.751	5,265	NA
Model 2					
Northeast	0.002	0.003			
MSAs outside Northeast	0.006	0.001***	40.731	5,264	2.585
Model 3					
Centralized MSAs	0.013	0.004***			
Decentralized MSAs	0.005	0.001***	40.729	5,264	2.843
Model 4					
Comprehensive states	0.006	0.001***			
Horizontal states	0.004	0.003			
Vertical states	0.007	0.002***	40.746	5,263	0.323
Model 5					
Florida	0.006	0.001***			
Maine	−0.003	0.004			
Maryland	−0.006	0.008			
New Jersey	0.003	0.004			
Oregon	0.008	0.003***			
Rhode Island	0.004	0.003			
Vermont	0.005	0.003*			
Washington	0.005	0.004	40.708	5,257	0.694

a. SSE = sum of squared errors
b. DF = degrees of freedom
*$p < .10$; **$p < .05$; ***$p < .01$

differences is statistically significant at the .05 level. Furthermore, only the restriction imposing constant parameters across centralized and decentralized MSAs is significant at the .10 level. This suggests that the impact of a state growth management program over time is relatively similar across states, program designs, and regions of the U.S. While the relative impact of state growth management programs is somewhat smaller in central cities that have had less success in attracting population levels, this difference is only weakly significant.

The finding that the effect of growth management programs is the same across states and program differences is surprising given other studies that cite intergovernmental complexity in program design as an important determinant of future program implementation success (for reviews, see Burby et al., 1997; Goggin et al., 1990; and Pressman & Wildavsky, 1984). Our findings do not necessarily contradict these studies; they merely suggest that program design differences related to consistency requirements or state-specific factors are not significant sources of variation in implementation success. It may be the case that other factors not examined here are important, such as state expenditures on implementation and local capacity for implementation.

Conclusion and Policy Implications

This study has examined the effects of state growth management programs on the spatial pattern of new housing investment. In particular, we examined the effect of state growth management programs on the share of new residential construction activity that was attracted by primary central cities within individual metropolitan areas. Using descriptive and multiple regression analyses, we find evidence to support the claim that over time, primary central cities located in states with state growth management programs have attracted marginally higher shares of residential construction than primary central cities in other states. Furthermore, this effect is significant only after controlling for metropolitan-area fixed effects. Given the significance of the fixed effects in our model, our evidence suggests not controlling for these effects will result in biased estimates of the effects of state growth management programs.

Our findings do not support the view that the effects of state growth management programs vary substantially across states or across programs with different combinations of consistency requirements. Also, we do not find evidence that state growth management programs have succeeded in only a few states in the West. We find weak evidence that state growth management programs will tend to be more successful in cities with a history of success in attracting residential populations.

These findings, if corroborated by additional research, suggest that state growth management programs may have the potential to contribute to a comprehensive strategy of central-city revitalization. By restructuring the local land use decision-making process, primary central cities may stand to eventually regain some degree of competitiveness in the regional housing market. Our findings also suggest that states can tailor programs to state-specific needs without compromising overall growth management goals. We stop short of suggesting that program design does not matter, however. Since we did not examine other dimensions of program design and implementation, we conclude with a call to researchers to further investigate the dynamics of state growth management policy implementation. We also urge researchers to focus future analyses on the most distressed cities in growth management states, due to our weak but significant finding that the effect of state growth management programs on central-city revitalization has been relatively weaker in cities with a history of population loss to surrounding suburban areas.

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NOTES

1. We conducted an F-test and a Lagrange Multiplier (LM) test to determine whether or not group-specific effects should be taken into account in the estimation of regression model parameters (Greene, 2000). Both are tests of the appropriateness of an ordinary least squares (OLS) model with a single constant term, but the LM test is useful only as a test for the appropriateness of a random-effects specification over the OLS model with a single constant. Both test statistics were significant at the .01 level, indicating that the OLS model with a single constant is inappropriate for this data and would produce biased estimates of the model parameters.
2. We chose not to define state growth management programs based on the existence of a mandate for local comprehensive planning. Although most states included in our list do require local comprehensive planning, we argue that without some form of policy consistency requirement, this mandate will have no effect on the structure of regional and local planning. Furthermore, since many states that require local comprehensive planning do not mention compact growth goals in the state legislation, consistency with state goals may have no effect on the types of policies adopted at the local level.
3. We thank an anonymous referee for bringing this to our attention.
4. Hawaii also has a state growth management program, but we did not include it in our analysis, as indicated by its absence from Table 1, due to the presence of a single permitting jurisdiction for the entire MSA of Honolulu. This would skew the results for Hawaii by implying a 100% capture rate for the central-city's share of residential construction over the entire sample period.
5. Since this measure is bounded by 0 and 1, the relationship between independent variables and the dependent variable could potentially take on a curvilinear shape near extreme values of the dependent variable, thus violating the linearity assumption of the OLS regression. Some suggest transforming dependent variables measured in percentages to ensure that variables exhibit constant variances throughout the range of the data and to ensure a linear relationship between the dependent variable and the independent variables (see, e.g., Burby et al., 2000). We examined several transformations, but since few of the observations in our data are measured at 0 or 1, we chose instead to run our analyses on the original dependent variable to facilitate an easier interpretation of coefficient estimates. Box and Cox (1964) suggested choosing power transformations of the dependent variable such that the sum of squared errors (SSE) is minimized. The SSEs for our original model, square root-transformed model, and log-transformed model are respectively, 40.8, 39.5, and 2794.4. This suggests that any transformation to a power greater than 1 or below 0 would produce unsatisfactory results. Furthermore, the improvement in fit associated with a square root transformation is only marginal. Coefficient estimates and standard errors were comparable, so we focused on the untransformed regression to facilitate the interpretation of parameter estimates.
6. As one referee pointed out, one might argue that a central city's share of MSA population both affects and is affected by the dependent variable in this model. Obviously, new housing is constructed to eventually be occupied. We acknowledge this possibility, and argue that there are also costs associated with omitting the variable from the equation. If existing population levels capture the relative attractiveness of the city as a residence and this variable is omitted, then all variables that are correlated with this variable, including our policy variable, will be biased. A natural extension of our approach would be a simultaneous equations model that explicitly separates supply from demand.

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7. In an earlier model, we also included a dummy variable indicating the presence of the state growth management program to test for a fixed-component effect. Since this variable was not significant at the .10 level, we did not include it in our analysis. We also ran a regression on a pooled sample of housing construction over the 1995–1998 period using a simple dummy variable indicating the presence of a state growth management program. This dummy was positive but statistically insignificant in this regression.
8. In our study, the fixed-effects model is more appropriate than the alternative random-effects specification for two reasons. First, a random-effects model would be more appropriate if we had randomly drawn a few MSAs from the total population of MSAs. Such is not the case here, as this data includes all major metropolitan areas within the U.S., with the exception of a small number of MSAs that were omitted due to missing data (see Table A-1). Second, the random-effects model relies on a crucial assumption that is not likely to be met in this data set: The individual effects must be uncorrelated with the other explanatory variables (Baltagi, 1995). In our data set, the unobservable effects captured by the MSA-specific controls include housing price differentials within metropolitan areas, regional amenities, and other location-specific factors. Since each of these variables is likely to be correlated with the intraurban housing demand variables included in our model, a fixed-effects model is more appropriate.
9. Group-specific RHOs do not lead to overall improvements in the model due to the small number of observations used to calculate individual autocorrelation coefficients. As Beck and Katz (1995) demonstrate using Monte Carlo experiments, the use of a single RHO typically outperforms models with a variable RHO even in models with a large number of time series.
10. There are several reasons for adopting this procedure. First, when errors are homoskedastic and contemporaneously independent, panel-corrected standard errors (PSCEs) perform as well as accurate OLS errors and outperform OLS errors as the OLS errors become less spherical (Beck & Katz, 1995). More importantly, PCSEs have been shown to be robust even in the face of groupwise heteroskedasticity and contemporaneous correlation, whereas feasible generalized least squares (FGLS) techniques are robust only when heteroskedasticity is very large and contemporaneous correlation is nonexistent. Contemporaneous correlation is sure to exist in this data due to the proximity of many MSAs to one another (many MSAs are actually Primary Metropolitan Statistical Areas [PMSAs] within larger Consolidated Metropolitan Statistical Areas [CMSAs]) and due to the fact that macroeconomic factors affect all MSAs in the same manner. To test for cross-section heteroskedasticity, we conducted the appropriate LM test on the initial OLS model. Since the chi-square statistic for this test greatly exceeded the 95% critical chi-square statistic, we opted for the Beck and Katz (1995) PCSE approach.
11. Statistical analyses were performed using SHAZAM and LIMDEP econometrics packages.
12. We also examined all independent variables to test for possible multicollinearity among the independent variables. The correlation matrix (not reported for brevity) suggests that the only variables that exhibit high degrees of multicollinearity are SHPOP and SHXUNIT. Although the correlation coefficient for these two variables is .989, we decided not to omit either variable from our model because theory suggests that each should be included. Since multicollinearity only inflates standard errors, whereas omitting an important variable biases the remaining coefficient estimates, we conclude that omitting either variable is potentially more damaging than any problem caused by multicollinearity. Furthermore, our results suggest that both SHPOP and SHXUNIT are significant at the .01 level. The fact that these variables are statistically significant despite multicollinearity only further validates the importance of each variable to the model.
13. Buse (1973) recommended the use of this statistic over the traditional R-squared as a goodness-of-fit measure for generalized least squares (GLS) models. The Buse raw-moment R-squared is appropriate for GLS models with no intercept.
14. We should point out that our simple categorization ignores other dimensions of state growth management programs, such as the strength of state agency oversight, design elements not related to consistency, and the state of growth management practice at the time of program adoption. We invite future researchers to elaborate on our findings to determine if these dimensions also have significant impacts on the pattern of urban development.

REFERENCES

Baltagi, B. (1995). *Econometric analysis of panel data.* West Sussex, UK: John Wiley & Sons.

Beck, N., & Katz, J. N. (1995). What to do (and not to do) with time series cross-section data. *American Political Science Review, 89*, 634–647.

Bollens, S. A. (1992). State growth management: Intergovernmental frameworks and policy objectives. *Journal of the American Planning Association, 58*, 454–466.

Box, G., & Cox, D. (1964). An analysis of transformations. *Journal of the Royal Statistical Society, Series B*, 211–264.

Burby, R. J., Berke, P., Dalton, L. C., DeGrove, J. M., French, S. P., Kaiser, E. J., May, P. J., & Roenigk, D. (1993). Is state-mandated planning effective? *Land Use Law and Zoning Digest, 45*(10), 3–9.

Burby, R. J., May, P. J., Berke, P. R., Dalton, L. C., French, S. P., & Kaiser, E. J. (1997). *Making governments plan: State experiments in managing land use.* Baltimore: Johns Hopkins University Press.

Burby, R. J., May, P. J., Malizia, E. E., & Levine, J. (2000). Building code enforcement burdens and central city decline. *Journal of the American Planning Association, 66*, 143–161.

Buse, A. (1973). Goodness of fit in generalized least squares estimation. *American Statistician, 27*, 106–108.

Carruthers, J. I. (2002). The impact of state growth management programmes: A comparative analysis. *Urban Studies, 39*, 1959–1982.

019540

Chow, G. (1960). Tests of equality between sets of coefficients in two linear regressions. *Econometrica, 28*, 591–605.
DeGrove, J. M., & Miness, D. A. (1992). *Planning and growth management in the states: The new frontier for land policy*. Cambridge, MA: Lincoln Institute of Land Policy.
Deyle, R. E., & Smith, R. A. (1998). Local government compliance with state planning mandates: The effects of state implementation in Florida. *Journal of the American Planning Association, 64*, 457–469.
Downs, A. (1999). Some realities about sprawl and urban decline. *Housing Policy Debate, 10*, 955–974.
Fischel, W. (1989). *Do growth controls matter? A review of empirical evidence on the effectiveness and efficiency of local government land use regulation*. Cambridge, MA: Lincoln Institute of Land Policy.
Gale, D. E. (1992). Eight state-sponsored growth management programs. *Journal of the American Planning Association, 58*, 425–439.
Garreau, J. (1991). *Edge city: Life on the new frontier*. New York: Doubleday.
Goggin, M. L., Bowman, A. O. M., Lester, J. P., & O'Toole, Jr., L. J. (1990). *Implementation theory and practice: Toward a third generation*. Glenview, IL: Scott, Foresman.
Greene, W. H. (2000). *Econometric analysis* (4th ed.). Upper Saddle River, NJ: Prentice Hall.
Hsiao, C. (1986). *Analysis of panel data*. Cambridge, UK: Cambridge University Press.
Institute for Business and Home Safety. (1998). *Summary of state land use planning laws*. Retrieved June 1, 2001 from http://www.ibhs.org/research_library/ view.asp?id=302
Kain, J. F. (1993). The spatial mismatch hypothesis: Three decades later. *Housing Policy Debate, 3*, 371–459.
Kasarda, J. D., Appold, S. J., Sweeney, S. H., & Sieff, E.(1997). Central city and suburban migration patterns: Is a turnaround on the horizon? *Housing Policy Debate, 8*, 307–358.
Knaap, G., & Nelson, A. C. (1992). *The regulated landscape: Lessons on state land use planning from Oregon*. Cambridge, MA: Lincoln Institute of Land Policy.
Lewis, P. G. (1996). *Shaping suburbia: How political institutions organize urban development*. Pittsburgh: University of Pittsburgh Press.
Massey, D. S., & Denton, N. A. (1993). *American apartheid: Segregation and the making of the underclass*. Cambridge, MA: Harvard University Press.
Mills, E. S., & Price, R. (1984). Metropolitan suburbanization and central city problems. *Journal of Urban Economics, 15*, 1–17.
Nelson, A. C., & Moore, T. (1996). Assessing growth management policy implementation: Case study of the United States' leading growth management state. *Land Use Policy, 13*, 241–259.
O'Sullivan, A. (2000). *Urban economics* (4th ed.). Boston: McGraw-Hill/Irwin.
Porter, D. R. (1993). State growth management: The intergovernmental experiment. *Pace Law Review, 13*, 481–503.
Prais, S., & Winsten, C. (1954). *Trend estimation and serial correlation* (Discussion Paper 383). Chicago: Cowles Commission.
Pressman, J. L., & Wildavsky, A. (1984). *Implementation* (3rd ed.). Berkeley: University of California Press.
Rusk, D. (1993). *Cities without suburbs*. Washington, DC: Woodrow Wilson Center Press.
Shilling, J. D., Sirmans, C. F., & Guidry, K. A. (1991). The impact of state land-use controls on residential land values. *Journal of Regional Science, 31*, 83–92.
Spain, D. (1989). Why higher income households move to central cities. *Journal of Urban Affairs, 11*, 283–299.
Stimson, J. A. (1985). Regression in space and time: A statistical essay. *American Journal of Political Science, 29*, 914–947.
U.S. Bureau of the Census. (1994). *Geographic areas reference manual*. Washington, DC: Department of Commerce.
Weitz, J. (1999a). From quiet revolution to smart growth: State growth management programs, 1960 to 1999. *Journal of Planning Literature, 14*, 268–338.
Weitz, J. (1999b). *Sprawl busting: State programs to guide growth*. Chicago: APA Planners Press.

APPENDIX

Data Sources and Variable Construction

The building permit data relied upon for this study was provided by the U.S. Census Bureau, Manufacturing and Construction Division. Data are inclusive of the years 1980 through 1998. The total number of observations includes 19 time periods and 293 MSAs for a total of 5,567 unique observations. Twenty-three MSAs were eliminated due to lack of sufficient data. We also omitted any MSA with only one permitting jurisdiction, because this would skew the results by indicating a 100% capture rate for the central city's share of construction over the entire sample period. For each of these 5,567 observations, data on several independent variables were available only by decade rather than by year, due to the frequency with which U.S. census data is provided. To estimate values of these independent variables for intermediate years where data was not available, we relied on a simple linear interpolation procedure. Table A-1 gives a detailed description of each independent variable and the primary source for data used in its construction.

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TABLE A-1. Variables and their data sources.

Variable	Description	Primary data source
SHRES	The primary central city's share of total MSA residential construction permits for year *t*. Constructed by first aggregating all permits issued by permitting jurisdictions for each MSA and for each primary central city within each MSA and then dividing the second by the first.	U.S. Census of Construction, 1980–1998
ANNEX	Primary central-city land area in year *t* divided by primary central-city land area in year *t*-10 with *t* = 1980 and 1990.	U.S. Census of Population and Housing, 1980 and 1990
SHINC	Per capita income adjusted by the Consumer Price Index price deflator.	U.S. Census of Population and Housing, 1980 and 1990
SHDEN	Primary central-city population density divided by MSA population density. Land area for each MSA is calculated by aggregating 1990 county land area totals for all counties within each 1998-defined MSA.	U.S. Census of Population and Housing, 1980 and 1990
SHBL	Primary central-city percent African American population divided by MSA percent African American population.	U.S. Census of Population and Housing, 1980 and 1990
SHPOP	Primary central-city population divided by MSA population.	U.S. Census of Population and Housing, 1980 and 1990
MSAPOP	Total MSA population.	U.S. Census of Population and Housing, 1980 and 1990
SHXUNIT	Primary central city existing housing units divided by MSA existing housing units.	U.S. Census of Population and Housing, 1980 and 1990
YEAR	Trend variable equal to 1, 2, . . . , 19 for year equal to 1980, 1981, . . . , 1998.	Authors' calculations
GMYR	Policy variable coded 0 for all years in which a given MSA was not governed by a state growth management program and 1,2,3, . . . T for each year following the year in which the initial growth management law was adopted.	Bollens (1992), Burby et al. (1993), DeGrove and Miness (1992), Gale (1992), Institute for Business and Home Safety (1998), Weitz (1999a)

TABLE A-2. Descriptive statistics for regression analyses.

Variable	Mean	St. Dev.	Minimum	Maximum
SHRES	0.320	0.274	0.000	1.000
ANNEX	1.226	0.584	0.140	12.391
SHINC	0.967	0.151	0.409	1.967
SHDEN	19.723	24.923	1.211	277.376
SHBL	1.958	1.067	0.065	8.310
SHPOP	0.361	0.188	0.015	0.904
MSAPOP	595,684.029	981,729.049	56,735.000	9,215,947.000
SHXUNIT	0.375	0.191	0.011	0.916
YEAR	10.000	5.478	1.000	19.000
GMYR	0.726	2.750	0.000	25.000
Summary statistic				
N = 5,567				

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