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LINKING LAND USE PLANNING AND REGULATION
TO ECONOMIC DEVELOPMENT: A LITERATURE REVIEW

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Linking Land Use Planning and Regulation to Economic Development: A Literature Review

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ABSTRACT: This review examines how land use planning and regulation affect the performance of our regional economies and identifies a set of complex causal links that generate the possibility of countervailing effects. On the one hand, land use regulation or planning practice may promote regional economic development 1) by eliminating negative externalities and achieving amenity improvements, 2) by encouraging compact development that delivers not only environmental but also fiscal and economic benefits, 3) by improving transportation outcomes or broadening potential options for travel choices, and 4) by reducing uncertainty and transaction costs involved in the process of land development. On the other hand, it could hinder regional economic prosperity 1) by generating a more dispersed or mismatched pattern of development, if parochial local governments seriously distort market processes, 2) by increasing the prices of developable land, housing, and business spaces dramatically, and 3) by preventing regions from satisfying the increasing needs for labor as well as housing in a timely manner. It is concluded that linking land use planning and regulation to economic development is to seek a better way (in terms of institutional setting, timing, degree of restrictiveness, detailed approaches of the intervention, etc) of managing land use that promotes the positive or dampens the negative effects in a particular circumstance rather than simply reducing government interventions in land development or trying to find out a one-size-fits-all policy option.

KEY WORDS: Land Use Planning; Land Use Regulation; Economic Development; Regional Economic Growth

1. INTRODUCTION

Although it is widely recognized that regional economies and land uses are highly interrelated with each other, little is known about how a change or intervention in land use allocations influences the performance of regional economies. Particularly, in urban and metropolitan planning arena, the interactions between regional economies and land uses have traditionally been considered from a ‘top down’ perspective – i.e. regional economic growth and transformation that have significant effects on land use and the spatial structure of the region; but ‘bottom up’ interactions are rarely considered. This lack of appreciation of the ‘bottom up’ impacts thus may limit current land use planning practices and decision making. It might also generate some unintended conflicts between land use planning and economic development.

Does our land use planning or regulation really promote our economic well-being? Or, do we distort the market force in land development process and dampen the pace of economic growth or progress? This paper attempts to examine this issue by reviewing relevant literature and to derive some policy lessons for both land use planning and economic development.

One could contend that land use planning is not aimed at generating economic benefits. In addition, it can be claimed that economic development can be accomplished by taxation, labor force training, industrial policies, etc, rather than an intervention in land use. Although such claims are valid to some extents, a better understanding of the 'bottom up' causality must not be trivial, because 1) the land use planning exercise is one of the most powerful instruments in planners' hands; 2) regional economic prosperity is one of the common goals that are pursued; and most importantly 3) they are tightly connected with each other, as will be explored in this paper.

Some points need to be noted, before the review starts.

1) Land use regulation and land use planning differ from each other. Hopkins (2001) clarifies this point by stating "Regulations [are] ... enforceable assignment and reassignment of rights. Regulations affect the scope of permissible actions. Plans ... provide information about interdependent decisions in relation to expected outcomes but these plans do not determine directly the scope of permissible actions" (p. 9–10). In this literature review, however, the effects of governmental actions on land use are examined, including both land use regulation and planning practices, rather than distinguishing one from the other strictly. To some extent, land use regulation or policies can be regarded as a product of land use planning practice, although the implementation and enforcement are not generally decided by planners.

2) The dependent variable of interest in this literature review is the performance of regional economies. In fact, this is a somewhat illusive concept, associated with both qualitative improvement of the wealth creation process (i.e. economic development) and quantitative growth in production or employment size (i.e. economic growth). However, it would be useful to employ such an inclusive concept, because it is more relevant to a common goal: the economic prosperity of our regions.

3) Since different strands of research attempt to probe different causal links from land uses to regional economies, a broad range of literature needs to be reviewed and a broad-brush approach to identifying the causal mechanism needs to be presented in order to thoroughly understand how government actions in land use influence the performance of regional economies. Thus, this review tries to provide a synthesis of various studies from which the ‘bottom up’ causal links can be inferred. Covering a variety of studies inevitably results in a somewhat incomplete investigation of each branch of research and an exclusion of some studies that might be deserve to be mentioned. The focus of the paper will be on the findings and implications rather than the detailed research design, data treatment, and methodological improvements of individual researches.

4) The synthesis of literature is made along with the four categories, representing the major causal links: the connections through 1) *Development Pattern Changes and Spatial Structure Reformation*; 2) *Land Development Process Efficiency Improvements*; 3) *Supply Constraints and Price Increases in Property Markets*; and 4) *Labor Market Shifts*. Subsequent sections provide the review of the studies classified in each category with an emphasis on what the findings of the studies imply with respect to the land use – regional economy causal links.

5) Here, consideration is mainly given to urban and metropolitan areas, rather than rural settings. Although an intervention in land use probably generates a great amount of effect on agricultural-based rural economy, those areas are less likely to adopt many types of land use regulations and planning practices, compared with the urbanized regions where internal changes are dramatic, so that a systematic management of land use changes is in greater demand.

6) This literature review does not cover some research that examine the positive effect of a property rights reform on economic development by analyzing transitional economies or developing countries (e.g. Feder & Feeny 1991; Besley 1995; and Do & Iyer 2003), because the objective of this study is not to determine the contribution of stable private property rights to economic development but to understand the economic effects of prevalent land use policies in the U.S., where the property right system had been already firmly established.

2. CAUSAL LINK I: DEVELOPMENT PATTERN CHANGES AND SPATIAL STRUCTURE REFORMATION

Land use regulations are originally implemented to better manage the spatial arrangement of various human activities by controlling the associated use of land for the activities. For instance, traditional zoning is mainly designed to make a spatial form which minimizes negative externalities among different types of urban activities, by separating conflicting activities. Another typical example is provided by urban growth boundaries (UGB) which have been widely adopted in the United States to promote more compact and contiguous development, by allowing land use for urban purposes only within the boundaries.

Therefore, it is expected that the regulations actually change development patterns and further shape the spatial structures of the areas as intended. Numerous theoretical and empirical studies have paid attention to the effectiveness of a variety of land use regulation in achieving these expected outcomes – i.e. whether or not a particular type of regulation is really effective in modifying land development pattern; realizing a more desirable spatial structure; and generating some benefits of the well-managed spatial arrangements. If land use regulation really contributes to making a desirable form of our socio-economic activities, the performance of regional economies will be better off thanks to the benefits of a higher quality of life or “efficient urbanization”, as suggested by Cervero (2001) and many others.

2-1. Welfare Improvements by Correcting Market Failures

One typical example of this kind in literature is a set of studies justifying land use regulations based on welfare economics and supporting such justification with empirical evidence. Bailey (1959), Davis (1963), and others contend that the welfare level of land owners can be raised by an appropriate land use control, particularly zoning, that eliminates existing negative externalities among different uses; and that this welfare increase is a major benefit of land use controls. Gardner (1977) and Moore (1978) argue that land use regulations can also contribute to preserving public goods that are unlikely to be maintained without any government intervention, because the social values of the public goods are not seriously considered by private agents seeking their own interests. Lee’s (1981) article, “Land Use Planning as a Response to Market Failure” in which the regulations of the land market process are advocated, obviously highlights the same point that residents and the region can be better off with proper land use planning

practices that address intrinsic market failures in land use and, consequently, realize a more economically efficient way of land use.

Such claims – i.e. land use regulations can increase the welfare of land owners or even entire residents by correcting market failures – have been mainly buttressed by two sets of empirical analyses. The first is a set of research showing the virtual existence of negative external effects among non-managed land uses that implies potential contribution of land use regulations. For instance, Stull (1975) analyzes the property values of single family housing units across communities in the Boston metropolitan area and finds that the value is more likely to be higher, when the property is in the communities where the proportion of land devoted to non-single-family uses is low. This finding, as argued by the author, may imply that negative externalities, between single-family houses and other land uses, actually exist, so that a separation of different land uses by zoning ordinances would be warranted. Lafferty & Frech (1978) extend Stull's (1975) research with a more detailed land use data in the Boston again and conclude that “increases in non-single-family land uses within a town raises property values if suitably concentrated, but increasing the dispersion of a fixed amount of these land uses reduces property values.” (p.382). Although their finding indeed differs from that of Stull's (1975) work, it – i.e. a greater degree of dispersion of different land uses results in a lower property values – also supports the presence of negative external effects at neighborhood or more spatially disaggregated-level. Burnell (1985) tries to differentiate air polluting activities from other types of commercial and industrial land uses to obtain a refined understanding of the main source of negative external effects. What he found is that air polluting activities, represented by a dummy variable in his analysis, generates statistically significant negative influence on the house values, while other commercial and industrial land uses exhibit positive impacts. Hughes & Sirmans (1992) direct their attention to traffic intensity, rather than a particular type of land use. They assemble single-family house transaction data in Baton Rouge, Louisiana between 1985 and 1989; analyze how the traffic level on the streets influence the value of individual housing units using a traditional hedonic formulation; and find a statistically significant negative price effect of high traffic. Although traffic, as opposed to land use, is their focus, the traffic externality that they find may justify the need of zoning that separates commercial and industrial activities, inducing a greater amount of traffic flows, from residential uses.

The second group is the empirical researches that demonstrate the positive effect of environmental amenities, preserved by land use regulations, on house values.¹ Correll *et al.* (1978) analyze the effect of Boulder, Colorado's green belt on the prices of residential properties in the region. By conducting a regression analysis, they find that the walking distance to access to greenbelt has a negative effect on the property values – i.e. if a property is closer to the greenbelt, it is more likely to have a higher price. They interpret this result as a quasi-public good effect of greenbelts. In other words, the preserved open space and higher amenity level provided by the green-belt, generate some positive effect on residents' welfare; and this welfare increase and a better living environment might be capitalized into an increase in property price. Spalatro & Provencher (2001) investigate the case of minimum frontage zoning in northern Wisconsin, and also find that the regulation generates economic gains by preserving the lakefront amenities rather than causing the economic losses by constraining development. The significant positive impacts of amenities, preserved by environmental zoning, are also detected by Netusil (2005), in which consideration is given to the different effects of various types of amenity features.

It should be noted that, although a number of studies have provided empirical evidence supporting potential welfare gains of land use regulations as explained above, many others have reported that they could not find any statistically significant evidence of the effects. Crecine *et al.* (1967) analyze urban property transactions in the City of Pittsburgh and cannot report any evidence, implying externality or interdependence of the property market. Rueter (1973) investigates the case of Pittsburgh again; and ends up with the similar outcome that suggests “there is little likelihood that all of the external effects anticipated by the zoning ordinance actually arise in urban property markets” (p.336). In addition, Maser *et al.* (1977) detect insignificant externality except in some extraordinary cases in their analysis of land prices in Rochester, New York. Mark & Goldberg (1986) also argues that “the negative externalities that are generally assumed to exist may in fact not exist ... the use of zoning to control the effects of such presumed externalities may not be justified” (p. 257), based on the estimation outcome of their statistical analysis, showing inconsistent sign and magnitude, with the single-family house sales price data for a 24-year time period. Although these results might be attributable to

¹ Although the literature on the amenity effect is really voluminous, the studies, paying explicit attention to the role of land use regulations in preserving such amenities as well as measuring the effect of preserved amenity, are relatively few.

problems of data, model formulation, or estimation, the insignificance may imply that the extent of conflicts may be narrower than that suggested by received theory. Also, the status quo (the state without zoning) would not be a chaotic state with a prevalent negative externality bearing a great amount of dead-weight loss, so that the real contribution of zoning may not be very large.²

Regarding this branch of the studies, some additional points need to be noted. First, these studies typically paid attention to the prices of single-family housing units, assuming that the variable suitably represents the degree of comfortableness in living and residents' welfare level. Although it would be true that amenities are capitalized and represented by house prices, these prices are also determined by the supply side, as presented in a following section. It does seem that this supply-side effect is not controlled appropriately in much of this research. In fact, a location with a larger proportion of preserved natural amenities under an environmental zoning inevitably has a smaller capacity of housing supply within a given area of land. Since the housing supply will be more limited there, the house prices are likely to be higher only for the supply-side reason. In other words, it would be probable that the higher values of single-family units at the location with preserved natural amenities might be partly attributable to supply constraints. To be more convincing, verification needs to be made to assert that higher prices are attributable to the elimination of negative external effects or preservation of the amenities, rather than a relative supply scarcity.

Secondly, the welfare economics framework, which is static in nature, may not be perfect in dealing with the dynamics of urban environments, although the framework and market failure approaches are indeed useful. Within cities and metropolitan areas, a particular location, suitable for single-family houses at present, can become a desirable site for multi-family housing, business, or public facilities in the future. One might question whether zoning or other types of land use planning on the basis of static welfare economics and market failure approaches can really handle such dynamic problems properly, and then contribute to realizing an ideal spatial pattern that promotes inter-temporal economic well-being.

² It is well informed that residential and commercial-industrial land uses tend to be segregated even in Houston without zoning (See e.g. Siegan 1972 and Berry 2001). In other words, private deed covenants or other types of private bargaining in the market system can also mitigate negative effects.

2-2. Desirable Spatial Structures and Consequent Economic Benefits 1: Compact Development vs. Sprawl

While the research mentioned earlier focuses on the benefits of well-managed land use patterns, realized at neighborhood or lower levels of geographies, another set of research in literature has emphasized the contribution of land use planning or regulation to making the spatial structure of the entire region more desirable. These studies attempt to evaluate the spatial structure of the entire region based on certain criteria and to test whether or not a certain land use policy is effective in making the spatial structure better.

This set of literature includes research on urban sprawl vs. compact development. Because sprawling pattern of physical growth makes the public service provision inefficient (See e.g. Ewing 1996; Moe & Wilkie 1997; Burchell *et al.* 1998 and 2005; Ewing *et al.* 2002; Carruthers & Ulfarsson 2003; Muro & Puentes 2004), we can obtain some fiscal benefits and further favorable impacts on the performance of regional economies by curbing sprawl. Also, it has been suggested that compact development, which is a basis of agglomeration benefits and productivity increases, can deliver additional positive effects on regional economies (See e.g., Ciccone & Hall 1993; Nelson & Peterman 2000; Cervero 2001). Then, the issue is whether a particular type of land use intervention actually controls sprawl and promotes compact development without any side effects or causes a more dispersed spatial structure of the region.

Although mixed, generally land-use-based growth management policies have been considered effective in curbing sprawl, particularly when they are implemented with a systematic cooperation of multiple local governments.³ For instance, Nelson and Moore (1993) assess the effectiveness of Portland's urban growth boundary (UGB) by analyzing residential building permits, residential land divisions, and density of residential development from 1985 to 1989. They find that almost all new development had been directed into the UGB, although there are problems with the administration of growth management policies. Moore and Nelson (1994) evaluate another Oregon's growth management, namely the case of Medford MSA, with a similar method. They examine the location and density of new development, including

³ In contrast to many other studies, Jun's (2004) analysis of Portland's urban growth boundary suggests that the effectiveness is doubtful. He compares Portland with other 31 metropolitan areas and finds that Portland had not experienced less suburbanization and greater infill development during 1980 and 2000. In addition, according to his regression analysis, the presence of the urban growth boundary does not have a statistically significant effect on the location of new housing construction.

commercial and industrial development, for the same period of time (i.e., 1985~1989) and conclude that the policy is somewhat effective in directing new development into UGB and facilitating high-density development, though it does not sufficiently contribute to protecting resource lands. The effectiveness of Portland's UGB is also confirmed by Kline and Alig (1999). They analyze the land use conversion from forest or farmland to urban purposes using the USDA (U.S. Department of Agriculture) land use dataset and find that new development had been concentrated into the designated areas thanks to the UGB.

In addition to the above case studies looking at a particular growth management region only, some studies compare the growth management regions or states with control groups (comparable areas without such effort) and find the similar outcome, implying that growth management does accomplish its primary mission: sprawl control. Nelson (1999) examines the effectiveness of state-level growth management in not only preventing urban sprawl but also preserving farmland, reducing the automobile use, improving transit accessibility, supporting energy conservation, and minimizing tax burdens. Specifically, he compares Florida and Oregon representing the growth management states with Georgia representing the laissez-faire states. To pinpoint the effect of growth management on sprawl control, he takes a look at the density change from 1980 to 1990 and finds that Florida and Oregon had experienced a much smaller density decline than Georgia. Dawkins and Nelson (2003) also examine the effectiveness of state-level growth management in preventing sprawl and thus promoting the revitalization of central city areas by analyzing the spatial pattern of new residential development. They conduct a multivariate regression analysis using a panel dataset covering 293 metropolitan areas for 19 time periods (1980 to 1998) and find a statistically significant (positive) effect of state-level growth management on attracting new housing construction into the central cities. Similar to the research of Dawkins and Nelson (2003), Nelson *et al.* (2004) examine the effectiveness of various urban containment policies implemented before 1985 in attracting new development activities into the central cities. Through a simple comparison and regression analysis, it is found that central cities in the region with the containment programs attracted more development per capita, although they did not show a greater share of development within their metropolitan areas than control groups. In particular, according to their analysis, the effects of the containment policies are strong for the construction of multi-family housing units and for the remodeling or addition of commercial buildings.

In contrast to the growth management policies, some types of land use regulations, implemented by individual communities, seem to aggravate the problem of sprawl. Shen (1996) investigates reactive growth controls enacted by local governments in the San Francisco Bay area and finds a significant displacement effect, indicating a spatial dispersion of development, rather than a compact urban form. Pendall (1999) examines the effects of various locally adopted land use regulations on controlling sprawl. According to the outcome of his analysis, low-density-only-zoning and building-permit caps are associated with more sprawl, while land use controls which impose social costs of development to developers, such as adequate public facilities ordinance, are effective in reducing sprawl. Also, recently, a growing number of studies investigate the relationship between political fragmentation and sprawl and report that the level of fragmentation is highly associated with urban sprawl (See. e.g. Razin & Rosentraub 2000; Glaeser *et al.* 2001; Fulton *et al.* 2001; Carruthers & Ulfarsson 2002; Carruthers 2003; Ulfarsson & Carruthers 2006). One possible explanation of such correlation is that land use regulations implemented by fragmented municipalities for their own sakes, as opposed to ones based on a systematic cooperation among local governments, cause the sprawling pattern of development by excluding high-density development.

2-3. Desirable Spatial Structures and Consequent Economic Benefits 2: Land Use – Transportation – Regional Economy

While the studies on compact development vs. sprawl focus on density improvement and subsequent environmental, fiscal, and socio-economic benefits, another set of research evaluates the spatial structure of the region based on transportation-oriented criteria and examines whether or not and how land use policies improve or aggravate the spatial arrangement of our socio-economic activities in terms of transportation outcome. Although the research typically investigates the relationship between land use and transportation rather than paying attention to the implications on regional economies, the effects of land use policies on regional economies can be inferred via transportation, because 1) transportation plays an important role in supporting various economic activities, 2) congestion and even non-congested auto-based travels generate a significant amount of social costs, and 3) providing a broader range of travel choice options

would be an important factor of residents' welfare.⁴ Given that the transportation outcome has a significant effect on the performance of regional economies, in this connection, for the effects of land use policies on regional economies via transportation, the major issues would be 1) whether or not some types of land use regulation cause transportation problems (e.g. jobs-housing imbalances or excess commuting) and 2) whether or not we can cope with such problems by implementing appropriate land use policies.

A few studies have wrestled with the first issue – i.e. is a particular type of land use regulation responsible for jobs-housing imbalances or excess commuting? Levine's (1998) article and his book (Levine 2006) are a notable achievement on this issue. Based on the outcome of his analysis of the residential location in the Minneapolis and some other evidence, he argues that housing units for low or moderate income households may be "zoned out" due to the restrictive land use controls of many suburban communities favoring only low-density development. As a result, jobs-housing balances have not been a prominent feature of most U.S. metropolitan areas. Ihlanfeldt & Sjoquist (2000) also present survey-based evidence from the Atlanta, suggesting that jobs-housing imbalances have persisted due to the limited supply of affordable housing in sub-urban communities. Ihlanfeldt (2004) later indicates exclusionary land use regulation as a potential cause of this persistence of spatial imbalances, which generate an undesirable transportation outcome, by stating that "since land use regulations contribute to ... [the scarcity of affordable housing units in suburban areas] ... the implication [of Ihlanfeldt & Sjoquist's (2000) finding] is that they also contribute to the spatial mismatch problem" (p.272).

As noted above, the spatial jobs-housing imbalance that may originate in restrictive land use regulation, may generate greater transportation costs in the region. At the same time, this mismatching indicates a potential problem of the labor market within a region. In this sense, residential land use regulations indirectly affect business location decisions and further distort the spatial structure of the region. Section 5 deals with this adverse effect of land use regulation on the performance of regional economies via housing and labor market.

⁴ The interconnection between transportation sectors and regional economies has been well documented and better established, compared to the relationship between land uses and regional economies. See e.g. the articles in *The Annals of Regional Science Vol 42, No 3*, which is a special issue on transportation investment and economic development for the cutting-edge knowledge in this field.

With respect to the second issue – i.e. are some other land use policies effective in addressing jobs-housing imbalances, the persistent and dominant auto-based travel, congestion, or a limited availability of travel choice options? –, mixed land use, as a policy instrument, attracts attention. Research has explored the correlation between land use or urban design attributes and travel outcome and reports that not only a higher density but also a greater degree of land use mix are negatively associated with auto-based travel miles (See e.g. Cervero & Kockleman 1997; Crane 2000; Ewing & Cervero 2001, for a detailed review and synthesis of such researches). This correlation can be explained by the fact that mixed land use does reduce trip distance by bringing origins and destinations closer to each other and does reduce the auto-oriented trip generation by encouraging people to use alternatives such as walking or bicycles. Cervero & Duncan (2006) compare the magnitude of potential contribution of jobs-housing balance with that of retail-housing mixing using travel data from the San Francisco Bay Area and conclude that improvement in jobs-housing balance may be a more effective way of reducing vehicle travels.

However, as Crane (2000), Knaap & Song (2004), and some others point out, the research typically relates the transportation outcome to some land use attributes rather than the presence of land use policies. Also, there may be an endogeneity problem. For example, the real reason for the higher correlation between mixed-use and smaller vehicle travel may not be that mixed-use induces people to walk or use bicycles but that a group of people choose mixed use areas since they have a lower preference or financial capability of driving cars. For this reason, it is still inconclusive whether we will be able to get an improved transportation outcome by encouraging or promoting mixed-use. Furthermore, empirical evidence still needs to be assembled on how much transportation and economic benefits can be generated by the implementation of mixed-use zoning or similar measures.

3. CAUSALITY LINK II: LAND MARKET EFFICIENCY IMPROVEMENTS

Government interventions in land use may also be able to generate a favorable effect on the regional economic systems by improving the land market efficiency. Unlike other market transactions, land development is indeed a process with a high degree of uncertainty and information asymmetry. Consequently, it incurs a variety of and a large amount of transaction

costs, all over the entire course of development ranging from land purchase to construction and property transfers (See e.g. Alexander 2001 and Buitelaar 2004).

Throughout land use planning practice, information relevant to land use and development is produced – i.e. we analyze the current land use pattern; estimate the future demand of new development; determine the (potentially) suitable locations for new development, etc. Also, such information is widely distributed and helps the decision-makings of various actors involved in the process of land development and land use (See e.g. Friend & Jessop 1969 and Schaeffer & Hopkins 1987). Furthermore, certainty is somewhat guaranteed, when local governments announce future plans regarding land use pattern within and around the jurisdictional areas. In sum, compared to other institutional arrangements, having government involved in land use planning and regulation could be a more desirable institutional form of managing the land market and land development process.

The importance of this contribution of land use planning has been emphasized by some studies based on transaction-cost economic theory. For instance, Alexander (1992, 1994, and 2001) argues that the transactions in a free land market are unplanned and spontaneously decided in general, so tend to be a process with a large amount of unnecessary transaction costs, which could be reduced by land use planning. In his view, the presence of uncertainty and transaction costs, like the existence of externalities, is one of the main rationales of government intervention in land use. Dawkins (2000) also pays attention to this aspect of land use planning and contends that a land use plan or regulation as an agreement among the actors in the process of land development is able to lower the level of uncertainty and the transaction costs effectively.

However, empirical studies, validating such suppositions are scarce; little is known about the magnitude of land use planning's contribution to the uncertainty and transaction-cost reduction and the size of economic benefits, achieved by the contribution. What has been tested so far is limited to whether plans or information contained in plans really matter or not. Talen (1996a) discusses several approaches as well as critical issues in evaluating the plan implementation; and later she actually conducts an illustrative analysis with the case of Pueblo, Colorado by applying various methods (Talen 1996b). In this case study, she examines to what degree the locational pattern of parks in 1990 (a time point when an earlier plan was supposed to be realized) are consistent with the suggested pattern in the earlier plan. Overall, her finding is inconclusive with

respect to whether the plan had been successfully implemented or not. However, she reports that the access pattern on the earlier plan shows an explanatory power for the realized access distribution when some analytic methods are used, although they do not with some other techniques. Knaap *et al.* (2001) investigate whether a light rail plan influences the posterior land development in Washington County, Oregon. By analyzing land sales data, they find that the timing and pattern of land development were actually affected by the announcement of the plan that precedes any investment or enforcement. This finding implies that planning practice and information in plans really matter.

Probably, the difficulties in operationalizing the concepts and measurements are a major obstacle to conducting empirical studies that test the effect of land use planning on uncertainty or transaction-cost reduction. One recent study showed a way of overcoming such difficulties by looking at some other variables which may largely depend on uncertainty or transaction-cost level. Kim (2008) considers urban growth boundary (UGB) establishment as a process of information production and exchange; and analyzes whether or not the establishment of an UGB is effective in reducing the uncertainty level in the urban fringe land market. The idea here is that farmers may tend to increase the level of irreversible investments, if uncertainty of the development timing of their farmlands is reduced, because they would then be faced with a lowered level of the risk of wasting irreversible investment. Thus, the amount of irreversible investment, such as spending for soil improvement or facility constructions, can represent the level of the uncertainty to some extent. With this research design, he finds a positive effect of UGB establishment on reducing uncertainty that is measured by investment increase; however, the effect is not statistically significant.

4. CAUSALITY LINK III: SUPPLY CONSTRAINTS AND PRICE INCREASES IN PROPERTY MARKETS

While land use regulations can enhance the welfare of residents and further promote regional economic prosperity by shaping a better spatial pattern of human activities or by improving land market efficiency, they often constrain the supply of developable land and delay the development process, thereby affecting property sectors which are an important component and a fundamental

basis of regional economies.⁵ In particular, land use regulations tend to raise the costs for providing housing and other built structures and thus they may induce higher prices of housing and business space.

4-1. Housing Price Inflation

The effects of land use regulations on land or housing price are one of the most popular research topics in this arena; and literature on this issue is really voluminous. Pogodzinski & Sass (1991), Malpezzi (1996), Quigley & Rosenthal (2005) and some others provide more comprehensive reviews of the researches on the price effects.

Theoretically, it seems obvious that land use regulations can induce a certain level of housing price increase for both supply and demand side reasons. Also, significant price effects of many types of land use regulations, ranging from zoning to growth management policies, have been found in numerous empirical studies, although some exceptions do exist.⁶ Now, academic attention is increasingly paid to ‘why the price increases’ – i.e. does the observed price increase mainly come from a) amenity improvements and subsequent demand increase or b) the supply constraints and greater cost of development? – beyond ‘whether a certain type of land use regulation increases house price or not.’ This issue is critical because a different conclusion on the effect of land use regulation on the performance of our regional economies may be expected, depending on why house prices increase. If the price increase is mainly attributable to larger demand induced by a higher quality of life in the area, one can say that basically the regulation

⁵ The importance of property sector for economic growth has long been recognized. In addition, recently, a group of studies highlighted the critical role of property sector in determining the performance of regional economies, by changing business environments, controlling the internal changes to external shocks, and further influencing urban economic competitiveness (Begg 1999; D’Arcy & Keogh 1999; Gibb et al. 2002; Bramley & Lambert 2002).

⁶ It needs to be noted that some empirical studies have reported neglectable or small amount of price effects. For example, no consistent and statistically significant effect of zoning on housing price is found by Mark & Goldberg (1986), in which single-family house price data over a period of time longer than 20 years are analyzed. Philips & Goodstein (2000) analyze the effect of Portland’s UGB on housing prices in the region by comparing the Portland’s housing prices to those in other metropolitan areas with a regression technique. They report that “the urban growth boundary has created upward pressure on [land and thus] housing prices, but the effect is relatively small in magnitude” (p.334). They argue that higher density induced by the urban growth boundary mitigated the negative impact of the shortage of developable land. Downs (2002) also compares Portland’s house price change from 1980 to 2000 with those of other metropolitan areas to determine the price effect of the UGB. He finds a significant price effect only for a limited time period and argues that the house price increase is not an inevitable consequence of the land use regulation.

attracts new population and contributes to regional economic growth.⁷ In contrast, if the house price increase is stimulated by the limited supply, the conclusion would seem to suggest that regulation dampens the growth momentum by preventing a region satisfying the necessary need for growth. Also, in this case, inflation in housing expenses and development costs may generate significant economic impacts on not only construction but also other interdependent sectors in the regional economies as well as the residents' consumption and investment patterns. Moreover, as discussed in the following section, these changes further affect the regional labor markets, directly linked to the performance of the regional economies.

Although a large number of studies claim that land use regulations raise the demand of the area by improving amenity and thus increasing house price increase,⁸ recent studies increasingly suggest that the price inflation is mainly caused by limited supply or greater amount of the development costs under strict land use regulations. One of the most notable studies, identifying the main reason for the price increase (i.e. demand increase vs. supply shortage) is one by Pollakowski & Wachter (1990). Here, they attempt to estimate the effects of zoning restrictions on house prices by investigating the case of Montgomery County, Maryland. They find not only significant direct but also spillover price effects. The spillover effect is important, because it implies that the higher price is attributable to supply constraints rather than the demand-side reason. More specifically, the spillover effect "could only occur through supply restrictions in a closed rather than open-city model, unless the adjacent zone restrictions also affected the desirability of living within the nearby areas" (p. 323) that would not be the case in their analysis.

The supposition that the price effects of land use regulations are primarily attributable to supply constraints is also supported by the studies that investigate how housing supply is affected by land use regulations. For example, Thorson (1997) analyzes the case of agricultural down-zoning in McHenry County, Illinois and finds that housing supply, in terms of the number of building permits, significantly declined more than 5 years from zoning implementation. Levine (1999) examines the effect of another type of land use regulation, namely growth controls in

⁷ Of course, even in this case, the price increase may have some macroeconomic implications; and consideration needs to be given to the magnitude of increase, which would be determined by housing supply elasticity as well as the size of demand expansion in order to analyze the economic impacts of the price change precisely.

⁸ They include most researches, mentioned in section 2-1. But, again, some of these studies carelessly regard the higher price as an indication of lower level of disamenities or higher level of preserved amenities, rather than figuring out the exact cause of price increase with the consideration of supply-side effect as another possible explanation for the higher price.

California, and reports a similar outcome: the policy of interest (i.e. growth control) actually reduces housing supply, thereby inducing a higher level of house price. Mayer & Somerville (2000) and Green *et al.* (2005) relate the amount of housing supply or supply elasticity in metropolitan areas to the degree of overall restrictiveness of residential land use regulation in the regions that are quantified based on a variety of survey-based information. Both studies report smaller housing supplies and lower elasticity in highly regulated regions, that may imply land use regulations in general is indeed a supply constraint.

4-2. Higher Costs for Business Spaces

Since land use regulations can increase the price of developable land in a community or a region, it is anticipated that businesses need to pay higher costs for the sites or floor spaces for their production activities as well. This probable consequence of land use regulations could be important enough to be considered, when the macroeconomic impact of land use regulations is of our interest, because the site availability or land costs are one of the most important factors of industrial location decisions as shown in Calzonetti & Walker's (1991) survey and other similar research. In particular, some industries, requiring large sites for their productions, can be seriously affected by the scarcity or higher price of industrial land. Also, such effects can spread all over the entire regional economy through the inter-industry linkages.

In fact, such adverse economic effects of land use regulations are less likely to be documented in the U.S. literature, whereas the studies on the effects on house prices have been much more prominent.⁹ This is probably because the adverse effects are generally weak due to the favorable attitudes of local governments to commercial and industrial development (Cheshire & Hilber 2008). Actually, in the U.S., the tax system and fiscal incentives make local and state governments compete with each other to attract businesses into their jurisdictional areas.

Even in the U.S. context, however, land use regulations can cause a serious shortage of business spaces or even prevent particular production activities from settling in the region. 1000 Friends of Oregon (1982) check whether or not a sufficient area of land was allowed for industrial development in the Portland, where developable land is limited by the enforcement of its urban growth boundary and local governments' zoning and report that the industrial land supply was

⁹ The effect of land use regulation on the price of business space has been more researched in the U.K. or other countries where land availability is relatively low and more strict controls of land use exist (See e.g. Evans 2004; Henneberry *et al.* 2005; Cheshire & Sheppard. 2005; Cheshire & Hilber 2008).

much smaller than the estimated demand. They also find that some sites zoned for industrial uses are in floodplains or inaccessible to the existing infrastructure, so that the nominal supply, already less than demand, was even over-counted. Also, according to Hanushek & Quigley (1990), for the 1970s and 1980s, many local governments, particularly in California, had implemented restrictive non-residential zoning ordinances, designed to control industrial growth, because those activities are not fiscally desirable from their perspectives.

5. CAUSALITY LINK IV: LABOR MARKET SHIFTS

The effect of housing market changes, generated by land use regulations, on the regional labor pool would not be trivial, given that the spending for the housing takes a large proportion of total household expenditures (generally about 20 percent in the United States). More specifically, a higher housing price and limited supply of new housing 1) possibly increase the cost of living significantly; 2) make the region less attractive as a place of living; 3) pushes the labor supply curve upward; and eventually 4) hinder the economic growth of the region. Recently, a set of studies highlight this causal link from land use regulation to the performance of regional economies via housing and labor markets.

For instance, Glaeser (2006) strongly claims that land use controls constrain housing supply seriously and adversely affect the economic growth of the region, emphasizing “No Homes, No People, No Jobs” since “the economy cannot grow unless population grows and the population cannot grow without new housing” (p.2). In another paper, Glaeser *et al.* (2006) try to support a part of this argument empirically. By conducting an econometric analysis with U.S. metropolitan areas as determined by 1999 Census definitions, they detect the strict land use regulation’s positive effect on housing price and deterrent effect on population growth – i.e. in the metropolitan area with a strict land use regulation, population is less likely to grow responding to a same amount of labor demand increase, while housing price is more likely to increase, although no effect on income is found here. The magnitude of this effect is really great with the finding that “the effect of labor demand on population growth is 50% lower in areas

with highly regulated housing markets” (p.85).¹⁰ Saks (2008) investigates this issue empirically as well using a three-variable vector auto regression model. Here, consideration is given to not only short-run but also long-run impacts of land use regulations that restrict the easiness of housing supply. Based on the result of the empirical analysis, she reports that 1) land use regulations tend to lower the elasticity of housing supply, to increase housing price more, to raise the wage level, and to hinder employment growth, under a given constant labor demand increase, and 2) the adverse effect of land use regulations on employment growth extends over time. Vermeulen & Ommeren (2008) also examine this issue using a model of a simultaneous three-equation system – 1) labor force, 2) employment, and 3) housing. They find that employment growth is determined by labor supply in the area, which is predominantly affected by housing supply. Based on these findings, they argue that strict land use regulation, deterring housing and consequent labor supply, is responsible for sluggish regional economic growth.

So far, these studies, typically, focus on the aggregate population or labor force, rather than discerning different socio-economic groups. Studies, such as Downs (1991), Levine (1999), Anthony (2003), and Quigley & Raphael (2004) for example, indicate the serious scarcity of affordable units as a consequence of restrictive land use controls. This may imply that socio-economic groups would be affected by and react to the tightened housing market much differently, due to their different financial capabilities and asset holdings. When this disproportionate effect is considered, the labor market implication of land use regulations can be better understood. Furthermore, a different portfolio of industries within a region will generate different qualitative and quantitative labor demands, and thus a careful consideration of the disproportionate effect will enable assessment of the distinct impact of land use regulations on a particular industry and the overall influence on the industrial structure of the region.

6. SUMMARY & DISCUSSION

Throughout the literature review, a set of complex causal links from land uses to regional economies are identified (see figure 1). These links suggest that land use regulation and planning have countervailing effects on the performance of regional economies.

¹⁰ It needs to be noted that interregional variation with many other respects, except the degree of land use regulation, is not considered as a potential factor of the observed pattern – i.e. a lower responsiveness of population to the labor demand increase. In Saks (2008) as well, no alternative hypothesis is tested to corroborate the claims.

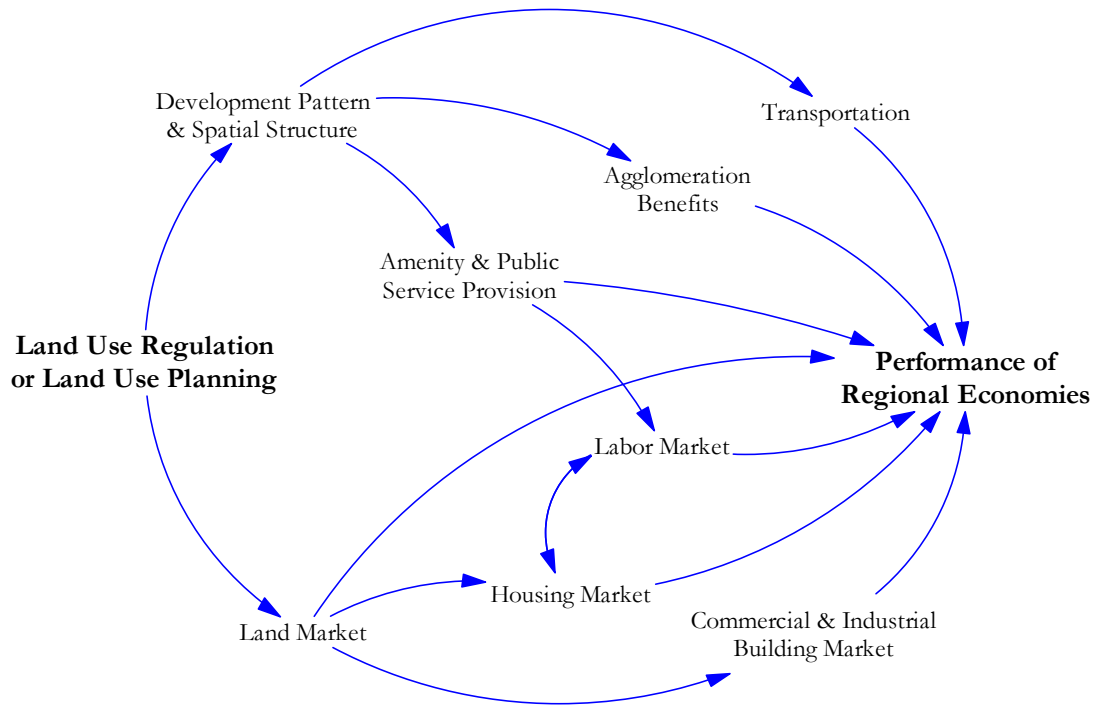


Figure 1: Complex Causal Links from Land Uses to Regional Economies

On the one hand, land use regulations may promote regional economic prosperity, 1) by eliminating negative externalities, preserving public goods appropriately, and then achieving amenity improvements, 2) by encouraging compact development, associated with higher efficiency in public service provision and other agglomeration benefits, 3) by improving transportation outcomes or broadening potential options for travel choices that have significant implications on regional economies, and 4) by reducing uncertainty and transaction costs involved in the process of land development. On the other hand, land use regulations could affect regional economies negatively, 1) by causing a more dispersed or mismatched pattern of development, rather than controlling urban sprawl, if parochial local governments distort market processes seriously with exclusionary land use regulations, 2) by reducing site availability for urban uses, imposing additional costs to developers, and increasing the prices of developable land, housing, and business spaces dramatically, and 3) by preventing regions from satisfying the

increasing needs for housing and labor, as the regional economies grow over time, in a timely manner.

Given that countervailing effects exist, in all probability, most regional economies will be pushed and pulled by the negative and positive effects of land use planning and regulation. The resultant forces may generate influences on regional growth and development that are dynamic in nature and have very complex time paths.

Linking land use planning and regulation to economic development would be to seek a better way (in terms of institutional setting, timing, degree of restrictiveness, detailed approaches of the intervention, etc) of managing land use that promotes the positive or dampens the negative effects rather than trying to find out a panacea-like policy measure. This can be accomplished by paying attention to how and why the policy outcomes vary by context. In what circumstances, are containment programs more likely to bring a greater efficiency gain in public service provision or agglomeration benefits, rather than generating housing affordability problems? When does the mixed-use zoning really contribute to reducing the auto-based long distance travels, rather than remaining as an additional regulatory barrier? To what degree and how do state or regional government bodies need to lead, guide, or involve in the land use planning practice to facilitate the systematic cooperation of localities, rather than harming local autonomy? Future research attempting to answer such questions must be valuable for a full integration of land use policies and regional economic development.

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