The Effects of Land Use Regulation on the Price of Housing: What Do We Know? What Can We Learn?

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Abstract

Effective governance of residential development and housing markets poses difficult challenges for land regulators. In theory, excessive land restrictions limit the buildable supply, tilting construction toward lower densities and larger, more expensive homes. Often, local prerogative and regional need conflict, and policymakers must make tradeoffs carefully. When higher income incumbents control the political processes by which local planning and zoning decisions are made, regions can become less affordable as prices increase. Housing assistance programs meant to benefit lower income households could be frustrated by limits on density and other restrictions on the number and size of new units.

The empirical literature on the effects of regulation on housing prices varies widely in quality of research method and strength of result. A number of credible papers seem to bear out theoretical expectations. When local regulators effectively withdraw land from buildable supplies—whether under the rubric of "zoning," "growth management," or other regulation—the land factor and the finished product can become pricier. Caps on development, restrictive zoning limits on allowable densities, urban growth boundaries, and long permit-processing delays have all been associated with increased housing prices. The literature fails, however, to establish a strong, direct causal effect, if only because variations in both observed regulation and methodological precision frustrate sweeping generalizations. A substantial number of land use and growth control studies show little or no effect on price, implying that sometimes, local regulation is symbolic, ineffectual, or only weakly enforced.

The literature as a whole also fails to address key empirical challenges. First, most studies ignore the "endogeneity" of regulation and price (for example, a statistical association may show regulatory effect or may just show that wealthier, more expensive communities have stronger tastes for such regulation). Second, research tends

not to recognize the complexity of local policymaking and regulatory behavior. For example, enactments promoting growth and development, often present in the same jurisdictions where zoning restrictions are observed, are rarely measured or analyzed. Third, regulatory surveys are administered sparsely and infrequently. Current studies are often forced to rely on outdated land use proxies and static observations of housing price movements. Fourth, few studies utilize sophisticated price indexes, such as those measuring repeat sales of individual properties. Such methods correct for well-known biases in price means and medians typically reported.

An agenda for future research in the area of regulatory effects on price should address these shortcomings and generate replicable findings relevant for policy reform efforts. Ideally, a national regulatory census would measure at regular intervals municipal enactments and implementation patterns. The most demanding aspect of this task is the development of standard regulatory indexes facilitating comparison at the municipal level and allowing for aggregation to the metropolitan and state levels. Over time, this survey should help describe changes in antecedent law and resulting land policy behavior so that time series encompassing regulation and price can be compiled. Existing building permit surveys can be adapted to facilitate this effort. Regular reporting from developers and builders regarding their experiences with local regulatory processes should then complement the census of laws and behaviors. An additional source of information would be a regularly refreshed, national land use survey, mapping in some detail the ever-changing patterns of residential and other development in metropolitan areas.

Early efforts to improve and expand research should focus primarily on the deliberate, painstaking development of better, more current data. When better data are available, the existing community of scholars will develop methods providing more reliable tests of hypotheses about the link between regulation and the well-being of housing consumers.

Introduction

Measuring the effect of local land use regulation on housing prices is a formidable empirical challenge. Land use rules are intended to recognize local externalities, providing amenities that make communities more attractive and housing prices higher. Restrictive zoning and growth controls, however, also tend to slow expansion and reduce net densities of the housing stock. We would expect these supply constraints to increase home prices. Distinguishing between these various impacts is complicated in practice. Local homeowners seeking to maximize home values and minimize tax burdens typically control the politics underlying land use enactments. In addition, many localities combine restrictions on new development with a range of economic incentives meant to spur it along. Measuring the economic constraints imposed by actual regulatory behavior and decisionmaking, as opposed to merely observing formal rules as adopted, is a difficult empirical problem, and comparisons across metropolitan areas are frustrated by the sheer variety of local practices.

This article offers some background on land use regulatory practices, particularly in terms of their history and legal basis. A review of these practices leads to a taxonomy describing the incidence and effects of land regulation in housing markets. The review of empirical literature provides a detailed framework for evaluating and understanding the available data about effects and magnitudes. In the conclusion, we recommend fruitful areas of inquiry to reduce our uncertainty about the importance of land use regulation in the housing market.

Historical Background[1]

Although casual observers presume that local land use authority arises from the police powers of cities and towns, in the American system local control is, in fact, entirely derivative. Under the traditional "Dillon's Rule," municipalities have no more power over their land than their state governments have delegated them (see Briffault, 1990; Frug, 1980).

Before the 1920s, experimentation with planning and zoning in U.S. cities and towns was sparse and arose primarily as a consequence of the desires of large-tract residential developers to eliminate industrial and commercial activities in their path. With the common law "coming to the nuisance" defense to such property tort claims still intact, developers turned to city councils for relief in the form of authorizing ordinances clearing the way. One such measure adopted in Los Angeles outlawed the operation of a brick kiln in place long before any of the nearby residences were built. The ordinance was upheld in the face of constitutional challenges in the U.S. Supreme Court's 1915 decision in *Hadacheck v. Sebastian* (239 U.S. 394). Answering the kiln owner's claims of wrongful confiscation of his business, the court remarked, "There must be progress and if in its march private interests are in the way they must yield to the good of the community."

A watershed moment in the history of city zoning was New York City's 1916 adoption of its trendsetting comprehensive ordinance. With numerous older cities facing drastic changes in land use and neighborhood character as a result of rapid industrialization, the U.S. Department of Commerce adopted and circulated in 1922 its Standard State Zoning Enabling Act, which within 3 years had spawned hundreds of conforming city zoning ordinances around the country. Key constitutional challenges brought by developers argued that the value of their investments had been so damaged by the regulation as to constitute an uncompensated taking in violation of the 5th Amendment or perhaps a violation of substantive due process in contravention of the 14th Amendment. The lower courts cursorily set these arguments aside, particularly after the zoning ordinance in the Cleveland-area suburb of Euclid, Ohio, was upheld in the U.S. Supreme Court's landmark 1926 decision in *Village of Euclid v. Ambler Realty Co* (272 U.S. at 394–395).

The *Euclid* case signaled the general legal validity of zoning ordinances aimed at segregating various land uses in a town plan. More specifically in terms of housing markets, so-called "Euclidean" zoning thereafter could permissibly separate single-family and duplex developments from multifamily apartment buildings. The court endorsed the view that apartments legally stood as commercial operations having less social value than detached homes. In *Euclid*, the landowner's claim to lost property value turned largely on a desire to build higher density residential structures, hoping to collect commensurately higher per acre returns. The high court practically equated such development with noxious industrial activities having deleterious effects on single-family neighborhoods:

> [A]partment houses [have] sometimes resulted in destroying the entire section for private house purposes….[T]he apartment house is a mere parasite, constructed in order to take advantage of the open spaces and attractive surroundings created by the residential character of the district. [The court then enumerated numerous evils accompanying multi-family development, such as noise, traffic, loss of open space, and loss of safety for children.] Under these circumstances, apartment houses, which in a different environment would be not only entirely unobjectionable but also highly desirable, come very near to being nuisances. (272 U.S. at 394–395.)

The court's blessing of local zoning prerogatives in *Euclid* led to expansive exercise of such authority in ways plainly biased toward protecting single-family home values.

Zoning and planning practices evolved into widely recognized professional disciplines as the American suburb came of age in the post-World War II period. Where developers and buyers would have reached identical arrangements of well-segregated uses, such ordinances were simply legal formalities rather than binding constraints. But as the inner cities deteriorated and federal urban renewal policy foundered, suburban arrivistes grew increasingly defensive of their property values. In the fragmented metropolis, the capture of a sustainable property tax base came to be viewed as a zero-sum game, and large-lot zoning became a tool for smaller governments to exclude low-income residents.

Lawyers and policy reformers during the civil rights era deemed such practices "exclusionary" zoning. Local land use practice was criticized for exacerbating segregation, not simply by consistency of land use and housing stock characteristics, but in more blatant ways by income and even racial characteristics (Danielson, 1976). Additionally, with adjacent towns essentially colluding in their land use policies to keep property values high, regions recognized the implicit tradeoff between, on the one hand, parochial development control through strict zoning, and, on the other hand, the resulting decline in overall housing production as vacant urban land supplies dwindled. A number of states experimented with land use reform, most notably in judicial form in the famous *Mount Laurel* exclusionary zoning cases in New Jersey.[2]

By the time suburbanization slowed substantially in the 1970s, land use practice turned to address a slightly different malady—the town that perceived new housing and population growth of any kind to be a threat to quality of life and household property value. Growth control regulations, which introduced such land use measures as numerical permit caps and outright moratoria on new residential construction, are largely a creature of sprawl in metropolitan areas in the West, where substantial open space still remains along corridors within tolerable commute distances of job centers (Lewis and Neiman, 2000; Landis, 1992). The exurban San Francisco Bay Area town of Petaluma, California, enacted one early cap on building permits.

Environmental advocates for smart growth, compact development, and infill reuse of parcels in central cities sponsored the adoption of urban growth boundaries (UGBs), such as those mapped around metropolitan Portland, Oregon, in the late 1970s. Modern land use regulation of the type that might conceivably affect housing prices comprises traditional zoning and more recently developed devices grouped under the aegis of growth control.

Taxonomies of Land Use Regulation

The sheer variety of local land use enactments makes it difficult to untangle the link between regulation and its economic effects. Such measures can be grouped into the five rough categories Deakin (1989) proposed:

1. Limits and geographic preferences on the density and intensity of development.
2. Design and performance standards for lots and buildings.
3. Cost shifting from the locality to the developer.
4. Withdrawal of land from developable supplies.
5. Direct and indirect controls on growth, applied against buildings and population.

Downs (1991) lists several kinds of regulation (for example, land use restrictions, building codes, environmental protection, and process requirements) that add delay and cost to housing production, thereby reducing the affordability of housing. Downs classifies three separate types of cost-increasing effects: (1) direct restrictions on the supply of housing units and land usable for housing purposes, (2) direct cost increases, and (3) delay. Reducing the supply of affordable housing also removes price competition which might lower the price of existing housing.

Exhibit 1 lists a detailed taxonomy of observed land use regulations. Its categories are derived from a 1992 planning survey of municipal development authorities in California (see Levine, 1999). Presumably, empirical models relating land use regulation to house prices would recognize this dimensionality; however, this level of comprehensiveness is typically infeasible in practice. In synthesizing existing research on this topic, we seek to identify the measures of regulation actually used in a variety of credible studies and suggest the strengths and limitations of the body of professional literature.

As a way of categorizing types of regional growth strategies, Nelson (2000a) introduced a category of land use regulation he called "urban containment." Such policies are borne of desires to make development more compact and to preserve agriculturally and environmentally rich sources of open space beyond exurban areas.[3] Nelson distinguished among three containment systems: (1) "closed regions," outside of which development is substantially curtailed and within which it is encouraged; (2) "open regions" not proscribing development beyond them; and (3) "isolated" containment lacking within-boundary incentives and leading to displaced construction beyond the metropolitan region (Nelson, 2000b; see also Downs, 2002). A recent survey of containment by Nelson and colleagues (Nelson, Dawkins, and Sanchez, 2003) analyzed a variety of regulations to ascertain the following information:

- If any "boundary" had been established.
- If all urban areas within the boundary were surrounded.
- How frequently land is added to the circumscribed area.
- If techniques, such as the following, are used to prevent development outside the boundary:
    - Large-lot (greater than 10-acre minimum) zoning.
    - Farm, forest, or open-space exclusive use.
    - Development right purchase/transfer.
    - Land banking.
    - Land suitability evaluation systems.

(See also Dawkins and Nelson, 2002.) The urban containment approach isolates land use regulation within an identified regional context at the expense of mapping intrametropolitan variation in any great detail.

Exhibit 1

Land Use Regulatory Categories

Residential development	Building permit cap Population cap Floor area ratio limit Downzoning to open space/agricultural use Reduction in permitted residential density Referendum for density increase Supermajority in legislative body for density increase
Commercial/industrial development	Square footage cap (commercial) Square footage cap (industrial) Rezoning to lower intensity Height reduction
Land planning	Growth management element Moratoria Urban growth boundary Tiered development Subdivision cap Other growth control
Adequate public facilities (APF) requirements	Roads Highways Mass transit Parking Water supply Water distribution Water purification Sewer collection Sewer treatment Flood control Other APF measures
Service capacity restrictions	Roads Water supply Water distribution Wastewater collection/treatment capacity Wastewater treatment quality Flood control
Development impact fee coverage	Administration Traffic mitigation Mass transit Parking Water: Service Treatment Sewer Flood control Parks/open space Natural resources Schools Libraries and arts Other development fees

Glickfeld and Levine's monograph (1992) reports the results of an exhaustive study of 907 growth control measures in 443 California jurisdictions, including specific measures affecting pace, intensity, infrastructure quality, and spatial extent of new residential, commercial, and industrial development: (1) population growth caps, (2) housing permit caps, (3) adequate public facilities ordinances, (4) residential downzoning, (5) required voter approval for upzoning, (6) required council supermajority for upzoning, (7) commercial square footage limits, (8) industrial square footage limits, (9) commercial/industrial infrastructure limitations, (10) commercial/industrial downzoning, (11) commercial height restrictions, (12) growth management elements of general plans, and (13) UGBs or greenbelts. Three factors explain the boom in growth control: (1) sheer population growth, (2) changing patterns of growth toward edge cities, and (3) the popular identification of growth as the cause for traffic, congestion, and declines in quality of life.

Differences in the average number of restrictive measures were associated with jurisdiction size. Jurisdictions lacking such measures tend to have a smaller population, have lesser education attainment, are only slightly poorer, and do not vary significantly by race or ethnicity. The authors tested prevailing assumptions about means of adoption and found that enactment of growth control via popular vote (so-called "ballot box planning") was far less prevalent than believed. Glickfeld and Levine found little association between growth control and actual local growth, leading to the possibility that adoption is largely symbolic or rhetorical. Actual development permits show some correlation with growth control, but this is an artifact of population size. Factor analysis of adoption patterns showed six rather distinct patterns:

1. Population control (permit and growth caps, UGBs).
2. Floor space control (commercial and industrial).
3. Infrastructure control (residential and commercial/industrial).
4. Zoning control (rezoning, downzoning).
5. Political control (voter approval, supermajority requirements).
6. General control (growth elements and others).

Reasons stated for growth control fell into three categories: (1) rural land preservation, (2) urban population growth containment, and (3) urban infrastructure protection. Greater numbers of measures adopted actually corresponded with increased adoption of pro-housing programs, but this, too, was apparently a population size effect. For overall construction trends, Glickfeld and Levine detected a strong quadratic relationship between a 3-year lag of nonresidential permit valuation and growth control adoption. The overall conclusion is that local growth control is a response to regional growth more than to local social or fiscal conditions. Theories why growth control does not stem growth include the following:

- Regulations are local; growth is regional.
- Regulation cannot compete with exogenous population pressures.
- Leakage occurs, and nearby growth bleeds across jurisdictional boundaries.
- Political compromise leads to strong talk in ordinances and plans but a "weak walk" in enforcement, variances, and permits actually negotiated.

Constructing a Framework

The traditional rationale for the regulation of land uses in urban areas is the promotion of economic efficiency through the control of external effects. Early litigation and judicial decisions describe these externalities in physical terms, for example, smoke and vibration from a manufacturing operation interfering with basic enjoyment of residential property (cf. *Hadacheck*). Numerous commercial activities, such as professional office practices in medical clinics and hospitals, are costlier if not adequately insulated from the disruptions caused by incompatible neighboring uses.

The economic prescription for limiting these external effects is the segregation of land uses—the partitioning of urban space so that these externalities are contained spatially. The particulates from industrial smokestacks are inoffensive when placed in an area zoned for heavy industry, but may cause economic losses in an area zoned for laundries.

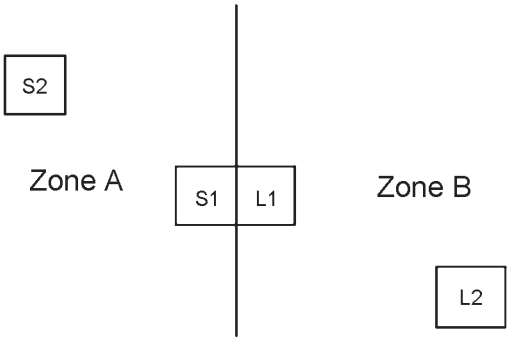
Exhibit 2, adapted from Bailey (1959), illustrates the effects of zoning regulations on the price of land put to different uses. In equilibrium, adjacent parcels of identical uses command equal prices, and this condition is not altered by drawing an administrative boundary between them. Adjacent parcels of land as inputs at S1 and L1 are priced identically due to their proximity to one another. If S parcels (with "smokestacks") provide a negative externality to L parcels (with "laundries"), L parcels further from the boundary (for example, L2) will be more valuable. As long as L parcels provide no externality to S parcels, the latter will be priced identically (for example, S2 = S1). For any pattern of externalities, it is easy to show that segregation of land uses maximizes land values and enhances efficiency.

Clearly, a large body of land use regulation in urban areas is intended to enforce this efficiency principle. The location of industrial activity is heavily regulated, and retail sites are allocated, at least in principle, recognizing the adverse consequence that might affect residences.

As land use regulation has evolved, however, the fiscal externalities between land uses may have become more important than the physical externalities that originally motivated the introduction of zoning. Suppose instead of laundries and smokestacks in exhibit 2, S refers to "snob" or high-income housing, and L refers to low-income housing, located in adjacent bedroom communities (in this instance, treating zones on either side of the diagram's main boundary as separate towns), each lacking a substantial nonresidential tax

Exhibit 2

Neighboring Zones: Boundary and Interior Parcels



base. Suppose further that taxes on housing finance public expenditures enjoyed on an equal per-household basis. Under these conditions, it is not hard to show that the segregation of housing illustrated in exhibit 2 is efficient (for example, Hamilton, 1976).[4] Taxes paid by residents on parcel S1 in Town A (that is, Zone A) in exhibit 2 are returned to them as public expenditures, as are the taxes paid by residents in parcel L1. Introducing a few units of L housing into Town A provides a negative externality to other residents of Town A and a positive externality to the residents of those units of L housing in Town A. (S households now pay more in taxes than they receive in public expenditures; L households are in the opposite circumstance.) Given sufficient coercive authority, land use regulators in towns dedicated to S housing can price development licenses to require builders of new L units to pay for the cost of the fiscal externality those units impose on existing residents (see, for example, Courant, 1976; Cooley and LaCivita, 1972).

Absent zoning regulation or other forms of development licensing, this spatial pattern of residences is inherently unstable. Those consuming S housing will always want to form an exclusive enclave, yet it will always be in the interests of those consuming L housing to locate in the midst of that higher income enclave. Zoning, thus, is a mechanism that permits a stable equilibrium in residential patterns and can promote efficiency in the urban region. Zoning laws chosen to limit the ability of builders to produce L houses in S communities create an artificial scarcity resulting in differences in the price of otherwise identical land as an input into L and S housing. If the price of land in L housing, thereby, is increased to reflect the capitalized value of the fiscal externality, the allocation is efficient. Households choose efficiently between L and S housing; all households pay for the public services they consume, and some residential integration between consumers of L and S housing is possible in equilibrium.[5]

These stylized models of land use regulation are far removed from zoning in practice and do not reflect real-world political and distributional considerations. It may be impossible to separate fiscal externalities from physical or social ones, for example, if lower income residents of L housing make a neighborhood of S housing less “desirable” to its residents. Town officials and land-use reformers alike cannot easily gauge whether neighborhood opposition is rational or rather arises from simple prejudice against residents of L housing who may be members of minority groups or, perhaps, are just poor. It may also be infeasible or socially undesirable to distribute local public expenditures efficiently, for example, if schools or health facilities redistribute resources to lower income households in ways residents of S housing cannot tolerate.

Finally, the political considerations of fiscal or social externalities may not lead planners to seek efficiency in resource allocation at all. If local governments can act as monopolists, then it will be in their interest to zone out less valuable houses or less desirable neighbors. Moreover, as a political matter, characterizing these actions as eliminating physical externalities will be expedient. As inflation increases home prices and the cost of providing local public service, local demand for restrictive zoning controls also will increase (Thorson, 1996; Cooley and LaCivita, 1972). Fischel (1985) points out that even where monopoly power is associated with higher home prices, other motivations (for example, wealth and endowment effects, preferences for segregation, and locked-in effects) may drive demand for regulation.

Exhibits 3 and 4 illustrate externality zoning and monopoly zoning. Exhibit 3 illustrates how the imposition of a restriction on land available for housing may increase social welfare when the incremental social cost per unit exceeds the private cost borne by the incremental resident. The imposition of a supply restriction, reducing available housing from Q_u to Q*, improves welfare by the amount of the shaded area.

Exhibit 3

Zoning Causing Welfare Gain

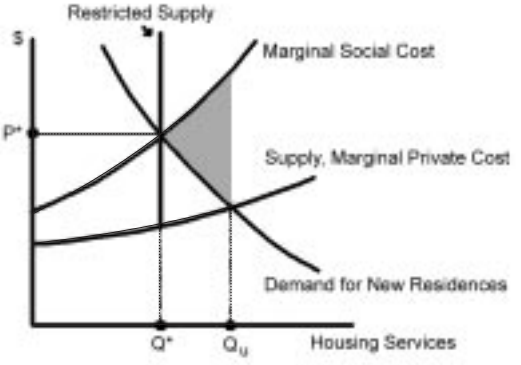
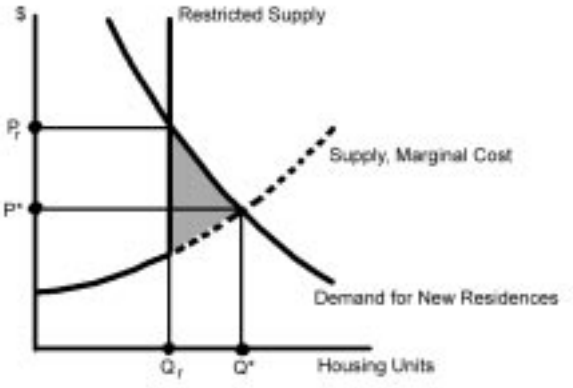


Exhibit 4

Zoning Causing Welfare Loss



In contrast, exhibit 4 illustrates the effects of zoning in the absence of these externalities. Restricting supply from Q* to Q_r reduces social welfare by the amount of the shaded area. Importantly, the exercise of monopoly power increases the housing prices paid by new residents from P* to P_r. With property tax finance, this arrangement enriches current residences at the expense of new residents (Fischel, 1992). Even in the absence of parcel-based taxation systems, localities use development impact fees and other mechanisms to capture the economic benefit of new construction (Gyourko, 1991; Ohls, Weisberg, and White, 1974).

Importantly, the most stringent forms of monopoly control in this setting arise if neighboring jurisdictions cannot undermine the supply restrictions imposed by the price-discriminating town. Monopoly control would be easiest to exercise if one regulatory body governed an entire housing market. If, instead, sets of fragmented localities are in perfect

competition with one another, long-run metropolitan supply levels could remain relatively unaffected, depending on the demographic composition of demand, among other factors. In the most competitive environment, standard house prices might remain essentially unchanged, and the total price of housing locations would differ primarily by the variable amenity packages produced in each place through land use regulation and local spending on public goods (see Thorson, 1996; Pollakowski and Wachter, 1990).

In the exercise of this kind of monopoly power over local development, town authorities may act as promoters seeking profit in league with private developers (Stoker, 1995). Local governments are likely to act strategically and even cooperatively with one another to maximize private returns on their regulatory decisions (Brueckner, 1998). Many commentators argue that the regulatory regimes observed are excessively restrictive even for fiscally protective purposes (for example, Downs, 1991), suggesting that exclusion rather than efficiency is the outcome of monopoly regulation.

When neighbors pose threats rather than opportunities, a vision of municipal competition for households on fiscal and other fronts seems quite credible. Some of the preferences that individual housing market actors and their local government representatives seek to vindicate are plainly discriminatory against minorities and the poor (Rolleston, 1987; Yinger, 1986), and they contribute to the well-documented race and income segregation in metropolitan areas (Massey and Denton, 1993).[6]

Fiscal zoning theory thus contemplates that exclusionary zoning has efficiency advantages relative to unregulated markets. According to this view, collectively charted land use controls ensure that public services will be provided only to those who pay their full costs. This kind of system has regressive tendencies. Incumbents and applicants for entry have varying demands and capacities to pay the marginal cost of the public services they consume. Thus, residents are tempted to discriminate not just on a first-come, first-served basis up to some density limit, but also through sifting among potential entrants by their ability to pay and their expected consumption of publicly provided goods.

If town residents could exercise total control over growth, we would expect the median voter to reject projects that engender losses in utility, financial, or quality of life considerations (Cooley and LaCivita, 1972). Zoning and property taxation are the methods by which voters or public officials force newcomers to increase their contributions to the fisc. Given congestion costs and externalities, and the political impracticability of price discrimination using taxes, growth controls may be an attractive solution to the local fiscal challenge. Property tax limits, such as California's Proposition 13, effectively make new residents less attractive and support growth control.[7] The determination of whether proposed new development, however, is profitable to the community depends on the details of financing and the cost characteristics of local service packages. With average-cost pricing and decreasing-cost conditions, new residents are welcome. The linkage between demands for housing and public services, the cost conditions for public services, and regulation and house prices makes it unlikely that the optimal zoning arrangement will be identified by planners or local politics.

Mills (1979) observed that most externalities involve only the exteriors of structures and increase with density. Such costs can be internalized through common ownership, as in some multifamily developments, but the high transaction costs of property assembly make this solution infeasible. On fiscal considerations, property taxes play the familiar role of prices in the exchange of goods: they pay production costs and deter consumption by those valuing the goods less. A head tax would be most efficient, but its regressiveness makes it implausible and undesirable. Mills characterized growth caps and permit moratoria as rather blunt instruments because new households are excluded regardless of the capacities to pay the private and external costs their entries engender.

Beyond the social mischief land use rules may cause, they also undermine the efficiency advantages of the unregulated, competitive land-housing market. In a later work, Mills (2002) grouped various land use barriers under the rubric of "urban density control," identifying the general impact irrespective of the precise regulatory tactic employed. Mills argued that competitive markets in housing services, neighborhood density, and the desirability of locations (proxied by commute distances from the urban center) should sort households efficiently according to their varying tastes. Excessive land regulation in exurban areas, driven by unreasonable fear of unwanted density, distort these markets and cause sprawl.

Private Bargaining as Substitute for Regulation

An alternative to coercive government regulation is a private covenant among neighbors. Fischel (1990, 1985) characterizes zoning as a reformation of private property rights. He distinguishes zoning from the private land covenants described above, and from arrangements in homeowners' associations (HOAs) in which each member specifically agrees, as a condition for entry, to be governed by a set of deed conditions and restrictions. By contrast, zoning systems involve government coercion and affect the fortunes of those who may not have explicitly agreed to the rules in advance. When disputes arise, individuals in HOAs must bargain with neighbors one-on-one or seek small-number political solutions before the HOA governing board. Market institutions may settle such disputes better than political or even judicial institutions, given that only markets can take any account of the interests of outside demanders as proxied by the interests of developers.

Numerous commentators have questioned whether local land use regulation is preferable to private contractual arrangements among neighboring landowners. Static zoning restrictions constrain land development in predictable ways, but fixed rules are unlikely to efficiently resolve spillover problems in changing local economies. In an important early law review article, Ellickson (1973) pointed out zoning's shortcomings in this regard. He argued that a more flexible and responsive system of restrictive covenants augmented by liberalized nuisance law and carefully modulated administrative fines would offer efficiency advantages. Siegan (1972) pointed out that zoning-free Houston, Texas, adequately manages spillovers by adopting deed restrictions and establishing informal neighborhood-based expectations. Another example of this kind of governance by neighborly agreement is the written set of covenants, conditions, and restrictions typically agreed to by purchasers of homes in common interest developments as part of their membership in local HOAs (Gordon, 2004; McKenzie, 1994). In this setting, regulation is made a self-implementing, endogenous system in which conflicts are vetted and settled within the HOA under its operating rules. Were the entirety of a town's housing stock composed of units with HOAs, the situation would be equivalent to substituting the rules within such fragmented subdivisions for the aggregate governance system of the town's plans and ordinances.

This internal governance, however, has its own costs. Spreyer (1989) showed that these covenants are costly or politically difficult to install where zoning is already in place or when neighborhoods are already developed. Drawn to Houston as a test bed, Spreyer sampled prices for single-family homes in areas of Houston that were (1) zoned, (2) governed by covenants, or (3) governed by neither zoning nor covenants. Spreyer found no significant difference between values in zoned and covenanted areas, but found values in both areas were significantly higher than those in areas lacking both zoning and covenants.

Recent studies show that unwanted neighborhood effects reduce land values only marginally and disappear over small distances. Kenyon (1991) summarizes six hedonic studies of the effects of unwanted land uses, such as power plants and pollution sources, on neighboring property values. Depressed property values are rarely as pronounced as feared, and economic effects dissipate quickly as a function of distance. Such "field effects" of

spillovers are rarely identified in local political battles, where bandwagons form to oppose not only the specific project under consideration, but all future ones as well.

Survey of Empirical Evidence

This section provides a survey of empirical evidence on land use regulation and its effects on housing prices. The claim that zoning and growth control effectively raise housing prices, thereby shaping development and demographic patterns, is far from conclusively established in empirical research. This section will review studies, developing a taxonomy for further comparison and analysis.

Methodological Issues

A critically important feature of the literature is the generally weak and indirect measure of regulatory variables. Given the lack of uniform national standards for measurement of land regulation as adopted and variably enforced, generalizing findings from the literature as a whole is difficult, if not impossible, to accomplish. The best studies are those that manage measurement uncertainty adeptly, such as by confining the analysis to a reasonable geographic scope. Others that depart from simple, palpable measures of regulation appear elegant and creative, but may end up trading off careful explanation for strained conclusions.

In a stylized setting of the problem, the researcher asks a set of local regulators to describe their land regimes. Given the wide variety of local enactments and enforcement patterns, no suitable method for summarizing regulatory behavior is obvious. Some surveys err on the side of completeness, posing an exhaustive list of possible enactments and asking each respondent which have been adopted, sometimes with a Likard-style scale attempting to measure the importance of each enactment (for example, Levine, 1999). These longer surveys often generate an undifferentiated set of dummy variables, and assigning weights in a summary measure is largely guesswork. Shorter survey instruments attempt to capture only those enactments deemed important beforehand so that prior hunches about their relative significance create possible selection bias in the results.

In a pure experimental sense, the a priori observation of legal restrictions would measure regulation in isolation, without regard for its observed impacts. Alternatively, an a posteriori approach would attempt to detect the effects of a regulatory framework based on outcomes such as the local authority's actual approval, rejection, and alteration of proposed residential construction projects. The latter approach is often frustrated by the developer's endogenous prior knowledge of the relative restrictiveness of a set of jurisdictions. The builder's savvy awareness of where new construction is welcome will influence where land is purchased and the number and size of new units to propose.

Malpezzi (1996) identified a number of possible regulatory indicators, most featuring a mixture of these theoretical perspectives on measurement. Several studies used surveys of local planning officials, identifying the presence or absence and sometimes the relative importance, of various land use enactments (for example, Levine, 1999; Glickfeld and Levine, 1992; American Institute of Planners, 1976) and even rent control (for example, HUD, 1991; National Multi Housing Council, 1982). The problems of constructing summary indexes aside, such surveys have the advantage of capturing an "on the books" state of local legal conditions at a particular time. At the same time, relying on such measures risks overestimating the stringency with which written enactments control local development decisions; without actual implementation, observed regulation may be largely symbolic. Another strategy employed in some early studies involved polling experts regarding their subjective assessments of the relative restrictiveness of an area's land use controls (for example, Segal and Srinivasan, 1985). Geophysical limits, such as the presence of water (Malpezzi, 1996) and ratios of vacant and buildable land by planning area (Pollakowski

and Wachter, 1990), also have been employed. Surveys of regulatory effects (for example, Linneman et al., 1990) asked local officials to estimate, frequently with artificial Likard scales, such factors as approval rates and application processing delays.

Another key aspect in assessing models of regulation and housing price is an evaluation of the choice of covariates that may influence real estate markets independently of land use restrictions. Several controls make repeated appearances in the literature. Income and income change directly affect aggregate home prices because housing and housing service are normal goods in most circumstances and across most income ranges. Income and other demand proxies, such as population, demographic change, and density factors, provide additional ways to isolate price variation not directly related to land use strictures. Variables attempting to capture regional macroeconomic conditions, such as those measuring trends in employment levels or general health of local business and commerce, are typically employed. Capital costs, as they vary by metropolitan area, may be tracked via proprietary data sources available through, for example, Boeckh or Means. Median age of housing stock and state of home repair are alternative measures. Indicators of municipal land use patterns, such as vacant land proportions, presence of geophysical barriers or impediments, and proximity to mass transit corridors, are often included. Researchers and analysts must ensure that land use features and regulatory constraints are not collinear. Finally, variations in home quality need to be tracked to control how differences in size, age, maintenance, and amenities influence transaction prices. This is a key point: the more sophisticated the analysis of housing prices—a formidable empirical challenge on its own—the more credible estimates of regulatory effects on prices become.

Monopoly Zoning Studies

One strand of empirical work attempts to evaluate the monopoly zoning hypothesis directly. These studies posit that the more fragmented the governance structures of an urban area, the less monopoly power any one town will have due to entry price competition from its neighbors. White (1975) and Hamilton (1978) theorized that larger suburban towns, like any market firm enjoying the prerogatives of concentrated supply, would be more able to exploit market power in pricing entry for housing and public service bundles than smaller jurisdictions in more fragmented regions. In political terms, this version of land supply behavior amounts to capture of regulatory decisionmaking by higher value landowners, seeking to ensure property values via protectionism. Hamilton's paper offered affirmative but weak evidence that less fragmented urban areas would be more prone to price discrimination driven by local land use controls. He sampled median home prices in only 13 metropolitan areas, and his rudimentary measures of zoning controls were number of municipalities per capita and a dummy variable for areas having more than four local governments. Estimated in two separate equations, the coefficients on these proxies for monopoly regulatory power were negative as expected, but statistically insignificant.

In a challenge to Hamilton, Fischel (1980) cast early doubt on the supposed effect of regulatory power concentrations. Fischel retested Hamilton's house price models using a more precise measure of metropolitan fragmentation. In a home price sample from the 1970 Census for 10 large urbanized areas, Fischel compiled more refined counts of local governments (for example, townships and villages) having control over development. An indicator variable capturing Baltimore and Washington, D.C.—the only areas in the sample with low fragmentation—had an insignificant coefficient, even having the wrong sign in one of the two specifications. Diluting the results even more, pairwise comparisons of the two relatively unified areas with all others in the sample yielded an abundance of insignificant results, again with mixed signs. Fischel's contrary findings in this regard represent an early example of the interesting but ultimately baffling methodological variety in this literature.

Later work on monopoly regulation and land price by Rose (1989) generated important innovations in measurement and estimation. Notably, Rose distinguished between "natural" (that is, geophysical) and "contrived" (that is, regulatory) constraints on developable land, and his models credibly tested their independent effects. Geographic variation was measured by the proportion of an urbanized area's surface occupied by water; the calculation included population density gradients meant to proxy for the radial fall in bid rents under the standard Alonso-Muth-Mills "flat city" price models. Rose used three different land price indicators; one measure was taken from Federal Housing Administration site price data and the others from Urban Land Institute (ULI) data on raw and improved land. In addition to governments per capita, Rose constructed two concentration ratios measuring the proportion of a region's area contained within its four largest jurisdictions. (One of these ratios used a denominator including the central city and the other accounted for total area net of downtown.)

These innovations failed to yield a clear resolution of the monopoly zoning hypothesis. Rose's regulatory measures all had the expected sign, but only one of nine models resulted in a statistically significant coefficient. The study is slightly more persuasive on the price-elevating impacts of so-called "natural," geophysical constraints on development, both in terms of strength of result and proportion of variance explained. Later work by Hendershott and Thibodeau (1990) probing how income influenced aggregate constant-quality home prices and the extent they differed from regional median prices reported quarterly by the National Association of Realtors, used Rose's concentration ratio as a control, finding no significant association with housing price.

More recently, Thorson (1996) examined monopoly zoning using decennial census data at the place level from 1970 through 1990 to analyze reported median home values. Unlike Rose, Thorson's more complex models included a multitude of housing and neighborhood quality controls, a number of which eluded Fischel's (1980) specifications (for example, age, size, commuting distance, units per square mile, and energy prices). Across all three census surveys and varied specifications of the model, Thorson's concentration ratio was significantly related to increased home values. The analysis also captured a significantly greater proportion of the variation in home price than earlier authors.

Thorson's more robust findings lend credibility to claims that government concentration is associated with higher home prices, particularly in more recent census years. The monopoly zoning literature as a whole, however, does not even attempt to evaluate the regulatory mechanisms by which this might occur. Such investigation requires detailed measures of actual local behavior beyond simply mapping the physical arrangement of jurisdictions.

Early Surveys and Place-Specific Studies[8]

From the mid-1970s, significant litigation relating to the effects of zoning and growth control in places like Ramapo, New York; Mount Laurel, New Jersey; and Petaluma, California, led to heightened attention to these phenomena in urban economic and other literatures. Before that time, studies such as Crecine, Davis, and Jackson (1967) and Rueter (1973)—denominated by Fischel (1990) as "zoning-does-not-matter" studies"—had not identified any systematic land price effects of various local zoning regimes. This literature has questioned whether the market follows regulation or vice versa, contending at times that the lack of confirmable impacts substantially weakened the case for zoning as a tool in the management of local externalities. This section will explore some of the studies published during the 1970s, 1980s, and early 1990s. In the aggregate, this work questions but fails to nullify the earlier empirical case against zoning. Zoning and growth controls may merely tend to verify and reproduce existing price differences in communities formed as households are sorted according to income, public service, and other dimensions.

Peterson (1974) sampled 1,500 single-family home sales in communities along Boston's circumferential highway, Route 128, during 1971. He found that increasing home construction densities (from one house per acre to four) increased the value of unbuilt land more than 30 percent. A supplemental sample of 68 vacant land sales similarly affected by varying density allowances produced nearly identical price differences. From the similarity between home and vacant land transactions, Peterson concluded that zoning effects are largely capitalized into land values, affecting housing prices relatively little. He posited that net housing price changes are a function of three different facets of downzoning, that is, increases in minimum lot size (in his study, from one-quarter to one acre). First, large-lot regulation likely induces more costly homes, which in turn increases prices of neighboring lots awaiting construction. Second, larger lots ease per-acre demands on public services such as education. Third, such density reductions effectively eliminate three homes per acre. The net effect of these impacts, Peterson argued, would actually force long-run housing prices downward, so long as the net value of lost housing construction exceeded the sum of neighborhood amenities and tax savings.

Mark and Goldberg (1986) compiled single-family home sales data from 1957 to 1980 for two separate Vancouver neighborhoods, one affluent and the other blue-collar. For each transaction, the authors observed a variety of housing quality features. At the parcel level, they also measured zoning characteristics, neighboring land uses, and history of zoning changes. Estimated in the aggregate and in separate annual regressions, their models could not confirm with any statistical reliability that zoning increased price, nonconforming uses reduced market value, or changes to less restrictive land controls increased market value. Zoning impacts on price were sometimes positive, sometimes negative, and sometimes completely insignificant.

Fischel (1990) used Mark and Goldberg's paper to launch an overarching criticism that still beleaguers much of the literature to this day: few analysts recognize, or compensate for, the inherent endogeneity of observed land uses and the regulations ostensibly dictating them. Counter to the intuitive causal story—of regulations regulating—tight zoning may instead be induced politically by the predilections of high-income households living in high-price homes. Econometric models that do not address this joint determinacy issue are inherently suspect.

Thus, a portion of early research in this area questions if adoption of such regulations has any real effect on prices, development patterns, or growth rates. In their 1988 survey findings on California land use practice, Glickfeld and Levine (1992) argued that regulation is local, but growth patterns are regionally determined. Their lagtime model suggested that regulatory adoption followed increased building permit activity. But nearby increases in demand cross jurisdictional boundaries, and political compromise leads to the appearance of strict standards that are often considerably weaker in enforcement. The regulation itself had a price; variances and conditional use permits represented negotiated buyouts of supposedly ironclad restrictions. The net effect of adopting development restrictions may ultimately be symbolic only, meant to appease "not-in-my-backyard" (NIMBY) and other constituencies, but generally lacking the will or ability to implement true growth management in the face of population pressures.

Landis (1992) also questioned whether growth controls work. Using California data in a quasiexperimental setup, he compared seven growth-controlled towns with six similar towns without such controls. Only three of the seven controlled cities grew slower than their uncontrolled counterparts, and prices were not appreciably higher as a result. Landis could not find systematic differences in municipal debt levels or fiscal condition indicators. He suggested that either the regulation is symbolic or uncodified constraint activity is

occurring in the control group jurisdictions. Growth control measures are usually adopted in response to high growth rates during market booms, and these subside due to natural economic cycles.

Numerous other studies question how binding land use enactments—and growth controls, in particular—are in practice. Warner and Molotch's (1992, 1995) survey of several localities in Southern California confirmed that growth continues unabated in cities adopting various growth control measures.

On the other side of the ledger, Segal and Srinivasan (1985) relied on interviews with regional governmental staff to develop a measure of the proportions of regulated and unregulated developable land from 1975 to 1978. A model of housing supply and demand included 51 metropolitan areas. Their results suggested that towns in which more than 20 percent of vacant land was regulated had significantly higher housing prices by a factor of about 6 percent. An intermetropolitan measurement problem arises, requiring that structural differences between housing sectors must be controlled. The authors recognized this challenge, but used precious few such variables. A growth restraint index (percent of land withdrawn from buildable supplies) was highly significant, capturing 40 percent of the variance in observed, home sales prices alone.

Similarly, Black and Hoben (1985) generated a scalar measure (running from + 5 [most growth-oriented] to – 5 [most growth-restricted]) summarizing a ULI survey of local planning officials in 30 metropolitan areas. Their dependent variables comprised experts' estimates of average land values in single-family-zoned and unimproved acreage on the urban fringe. Their restrictiveness indicator was quite significantly associated with higher land prices as measured in 1980, but less so for price increases observed from 1975 to 1980. An unpublished analysis based on an updated version of the ULI survey by Chambers and Diamond (1988) reported mixed results. Average project approval time was significantly and positively associated with higher land prices measured in 1985, but the same variable was negative and insignificant as a determinant of land prices measured just 5 years earlier.[9]

In a study of land prices across the country, Shilling, Sirmans, and Guidry (1991) used state-level land use and environmental data compiled during the 1970s by the American Institute of Planners (AIP) (AIP, 1976). Cities in states with stronger land controls were found to have slightly higher prices; the authors estimated the regulation/price elasticity to be about 0.16. The same authors (Guidry, Shilling, and Sirmans, 1991) used expert opinion data compiled by ULI; 11 experts in real estate ranked the land use restrictiveness of 30 metropolitan areas on a 10-point scale. The authors found that average 1990 lot prices in the 15 least restrictive cities were just less than $24,000, and that sample's most restrictive cities averaged lot prices more than $50,000.

Much of the literature seems to establish that land use regulation increases the price of existing housing while reducing the value of developable land. California studies prominently support this conclusion. For example, Schwartz and Zorn (1988) demonstrated that growth controls in the city of Davis, although not affecting the unit price of housing services, nevertheless increased the average amount of housing consumed, thereby increasing housing payments on average per household.

Dowall and Landis (1982) found that density controls in the San Francisco Bay Area were significantly associated with small increases in average residential land prices. Elliott's (1981) early study of building permit caps showed upward price effects in regions where numerous towns had enacted them; in areas where the control was adopted more sparsely, little effect was shown.

Frech and Lafferty (1984) analyzed the effect of a special program, the California Coastal Commission's restrictions on development in the coastal zone, and determined that withdrawal of developable land forced housing prices higher. Other California studies, like Wolch and Gabriel (1981) and two by Schwartz, Hansen, and Green (1981, 1984), used cross-jurisdictional comparisons to show that artificially restricting the pace of development had definite distributional impacts, namely, higher housing prices.

Land use restrictions may raise housing prices in myriad ways. Levine (1999) provided a taxonomy of these effects in his work. The cost of housing construction can be increased by subdivision requirements, exactions, and other development regulations. Some growth control systems might place numerical limits on the number of permits granted, further restricting supply. The intent often is to encourage higher quality and more expensive housing by increasing its profitability. Finally, when demand for moderately priced units shifts to adjacent areas without such restrictions, prices may rise in those places when supply cannot quickly respond to the shock (Landis, 1992).

More generally, restrictive land use policies add to the costs of housing development by restricting land supply. Towns may impose exactions and other costly requirements as conditions for permit or subdivision approval; they also may create onerous application procedures. Delays in the permitting process can cause developers to incur added interest cost, taxes, inflation, and overhead expenses. Changes in the variety of residences available can slow competition among various housing types. Indirectly, developers' failure to respond to demand quickly may cause an increase in price. Ultimately, these sources of friction in supply markets create barriers to entry for development firms and facilitate the setting of monopoly rents by existing providers (Dowall, 1984).

The net effect of density control on land prices, however, may be indeterminate. When land is withdrawn from a developable base, restricted supply tends to increase the bid price at which the market for such land will clear. But limiting density also makes raw land less valuable per acre as an input into new housing production (Morgan, 1984). These effects of density control run counter to each other, and the total impact of density restrictions on land prices is ambiguous.

The empirical literature on growth control, largely from California evidence, supports the case that supply effects dominate. In many studies, development restrictions are shown to increase price and bar the poor, thus exacerbating income segregation. Zorn, Hansen, and Schwartz (1986) studied price effects in Davis, California. The analysis took into account the imperfect implementation of growth limits and the presence of inclusionary programs meant to counterbalance the policy's effect on the poor. The authors also factored in the extent to which preexisting homes increased in quality. Nonetheless, the study concluded that price increased an average of 9 percent relative to the nearby suburbs of Sacramento, where growth controls had not been adopted.

Earlier studies focused on Petaluma, located north of San Francisco, which found its rural tranquility threatened by the Bay Area's suburban expansion in the early 1970s. In response to the sprawl creeping up the interstate highway, Petaluma adopted a pioneering growth control ordinance allowing only 500 building permits annually. Schwartz, Hansen, and Green (1984) compared Petaluma to the relatively unregulated market in nearby Santa Rosa.[10] Low-priced, small-floor-area homes began to disappear after growth management was imposed, and the housing stock shifted generally away from units affordable to low- and moderate-income households. The transition occurred, the authors concluded, because of the way Petaluma chose to assign its limited building permits among competing applications. Its ordinance used a "beauty contest" point system that rewarded costly design amenities at the expense of moderate-income housing (see also Schwartz, 1982).[11]

In a study of 1,600 home sales in 64 Bay Area communities in 1979, Katz and Rosen (1987) found even more drastic price increases associated with growth controls (permit caps and outright moratoria). Homes in towns with such development restrictions were 17 to 38 percent more expensive than elsewhere. These authors' measurement of land use regulation failed to account for differences in rules among towns in their sample. A single dummy variable identified the presence or absence of a growth management program. The authors' model did not address the likely endogeneity of regulation and housing market indicators, instead explaining:

> [D]ifferences in house prices could possibly be the "illusory" outcome of weakness in the statistical technique resulting from omitted variables, sample selectivity problems, or both. The positive price differential for houses in growth-controlled jurisdictions may reflect structural or neighborhood quality characteristics (not included in the model) that are correlated with the presence of formal growth controls. This is possible but not likely because the addition of extra quality controls as well as other characteristics on the subsample for which additional information was available did not tangibly alter the strength or direction of the results (Katz and Rosen, 1987: 158–159).

Importantly for the consideration of empirical work in the field, the modern view is that land use choices are endogenous, meaning that one cannot estimate their effects (for example, on prices, segregation, or neighborhood and housing quality) without accounting for the ways in which those effects themselves influence the land use choices being studied. The preferable method is to account for the simultaneity of various influences in a more complete model (Colwell and Sirmans, 1993). Ideally, such a model would address:

> the particular ways in which a community restricts growth (the growth-control instrument), the interrelationship between the determinants of land values (the cross-elasticity between implicit markets), and the interrelationship between growth-control and nongrowth-control communities (the cross-price elasticity between implicit markets) (Knaap, 1991: 471).[12]

In practice, however, the scarcity of data measuring each of these factors makes precise measurement problematic.

Portland's experimentation with metropolitan-level land regulation has provided an interesting natural experiment for housing price research. The "urban growth boundary" drawn in the late 1970s between the fringe of the city's exurban areas and surrounding agricultural sectors has drawn particular attention. The twin goals of sprawl prevention and farmland preservation motivate this kind of growth management. Knaap (1985) identified two boundaries: (1) an outer ring drawn to contain all growth until 2000; and (2) an inner ring, with the area between the two demarcated as growth-controlled at local option if desired densities have not been reached in the urban core. Knaap sampled land prices on undeveloped single-family sites located in all three categories: inner city, between the lines, and outside the year 2000 UGB. Controlling for distance from the central city, Knaap's results showed significant land price increments inside and outside the outer UGB. These results were replicated along the inner ring, but were most significant in the most affluent suburbs, perhaps because of the discretionary nature of that boundary. Knaap concluded the market perceived the constraint on new construction and the explicit time restrictions on development outside the exurban UGB to be genuine and binding, with prices falling into line accordingly (see also Phillips and Goodstein, 2000; Nelson, 1988).

More Recent Work on Price Effects of Zoning and Growth Management

Clever model design and data collection strategies can have high payoffs in this area. A thoughtful study by Pollakowski and Wachter (1990) sought to detect housing price effects within and across multiple jurisdictions in Montgomery County, Maryland (suburban Washington, D.C.). The authors generated a hedonically adjusted repeat-sales, housing price time series, measured quarterly across 17 planning areas of the county.[13] The authors constructed indexes of restrictive land use practices based on proportions of developed and vacant land in various zoning categories. To these localized measures, the authors added two additional land use regulatory measures: (1) an index to capture the effects of regulations in one planning area on its neighbors, calculated as a ratio; and (2) a growth control ceiling imposed on each planning area by the county. The models also featured a sophisticated set of covariates, including commute times from a central city hub, a gravity index of employment accessibility, and a construction cost index from standard cost estimator services. In the model combining all three land use regulatory measures, the in-zone and adjacent restrictiveness measures added significantly to home prices over time. Importantly, the effects of the growth ceilings, local regulation, and spillover constraints were greater when considered in the aggregate than when measured independently of one another.[14]

Malpezzi (1996) developed a mixed set of land use measures from the 1990 Wharton survey of planning and policy (see Linneman and Summers, 1993), which he combined with AIP state indicators and a rent control variable from a ULI survey. Malpezzi's analysis of reported home values and contract rents in the 1990 Census showed a significant association between tighter land restrictions and higher home prices. Only the AIP index had a statistically significant effect on rents. Malpezzi estimated the premium paid for moving from a liberal to strictly regulated environment to be 17 percent for rents, but more than 50 percent for house values. Later, Malpezzi, Chun, and Green (1998) estimated a more complex, two-stage model based on an updated version of the same regulatory measures and PUMS microdata on rents and home values. For both dependent variables, the linear specifications show positive and significant results for the instrumental regulatory index, with coefficients ranging from 0.02 to 0.08. The effect of moving from less stringent to more stringent regulation is estimated to be a 13- to 26-percent increase in rents or a 32- to 46-percent increase in asset prices for the quadratic models, or 9- to 16-percent and 31- to 46-percent increases, respectively, for the linear models.

In a more recent sample of 37 Milwaukee suburbs, Green (1999) traced the effects of six land use indicators: (1) the permitting of mobile homes, (2) minimum lot sizes in new subdivisions, (3) minimum frontage setbacks, (4) minimum street widths, (5) sidewalk requirements, and (6) curb and gutter requirements. The mobile home prohibition increased home prices between 7.1 and 8.5 percent; requiring an additional 10 feet of setback caused price increases of between 6.1 and 7.8 percent. Green also traced the effect of these land use measures on housing affordability, finding both the permitting of mobile homes and the imposition of street-width minima to significantly reduce the proportion of homes then priced below $75,000.

In a study of post-World War II growth patterns in the United Kingdom, Simmie, Olsberg, and Tunnell (1992) found that so-called urban containment policies tend to increase the long-run price of buildable residential land and finished housing. The authors noted that during slow economic times such land use policies are not a true constraint, but during periods of growth they may unwisely deflect job creation and housing investment to neighboring regions. The authors' focus was on regional and national open space and agriculture reservations, such as the London Green Belt, the designation of travel-to-work

area, and environmental protection of "areas of outstanding natural beauty" (Simmie, Olsberg, and Tunnell, 1992: 39). Based on other work on Britain by Evans (1988) and Cheshire and Sheppard (1989)—the latter comparing growth-controlled Reading and growth-oriented Darlington—Simmie and his colleagues asserted that the containment of growth had forced prices higher. Thus, they advocated reexamining the prevailing "garden city" design assumptions underlying sprawl containment policies in favor of forward-thinking land use planning that allowed for changing technologies in construction and transportation. Similar work on the United Kingdom by Monk and Whitehead (1999) bemoans the lack of experimental settings in Britain, where national standards broadly govern all local development-approval processes. Based on anecdotal opinion about behavioral differences in planning offices among three small towns outside London, however, these authors identified strong price-increase effects in the most restrictive town, with less difference observable among the other two (despite observed differences in regulatory flexibility).

Other authors have used the Far East as test beds for theories on land control's price effects. Malpezzi and Mayo (1997) calculated price and supply elasticities for Malaysia, South Korea, and Thailand and found that supply was more responsive to market signals in less regimented environments (see also Mayo and Sheppard, 1996). Fu and Somerville (2001) developed a methodology for assessing how floor area ratios distort builders' design choices, and then tested their methodology on a sample of 1992–93 land lease data for redevelopment sites in Shanghai, China. The authors concluded that allowable intensity of land use significantly affects price, as did neighboring population densities and related costs of resettling households displaced by the redevelopment projects under study.

Recent work by Glaeser, Gyourko, and Saks (GGS) (forthcoming) provides further evidence on the linkage between regulation and housing prices. The authors analyze data from Manhattan, a place where housing prices soared in the decade of the 1990s but additions to the housing supply were quite modest. Economic theory predicts that competition among builders will ensure that prices equal average costs. In unregulated markets, building heights will increase to the point where the marginal costs of adding an additional floor will equal average costs (which will equal the market price). If regulations limit sizes of buildings, free entry of firms will still keep price equal to average cost. With increasing marginal costs, however, both prices and average costs will exceed marginal costs. Using observations on prices and engineering data on costs, the authors measured the gap between prices and marginal costs in this most dense housing market in the United States. The analytical approach is straightforward, but it produces only indirect evidence. Moreover, if the construction industry is not fully competitive, the GGS procedure will overestimate the impact of regulation on market prices. This ambitious empirical analysis, combining information on market prices and supply costs, suggests that regulations, at least in New York City, have an important effect upon the cost of housing to consumers (see also Glaeser and Gyourko, 2003.

Conclusions and Recommendations for Further Research

Exhibits 5 and 6 present a summary of selected empirical work conducted before and after 1990, including studies reviewed in this article and others. As we have documented, despite many careful and thorough empirical analyses, drawing firm general conclusions about the linkage between local regulations and housing prices is not possible. Many careful analyses report some effect of regulation on housing prices, but many exceptions exist. For example, the measurement of housing prices in aggregate studies is often crude, relying on owners' estimates of house values from the decennial census; quality adjustments are ad hoc as well. In microeconomic studies, house prices also are measured crudely.

Exhibit 5

Summary of the Empirical Literature Linking Land Use Regulation and Housing Prices (pre-1990)

Author(s)	Year	Geography Covered	Regulatory Measure	Housing Price Measure	Other Variables	Type of Model	Results
Adams, Milgram, Green, and Mansfield	1968	Northeast Philadelphia, PA	Zoning (single-family, apartment, or row houses)	More than 1,000 sale transactions for undeveloped but zoned and subdivided lots, 1945–62	Transit accessibility, parcel location, expected time until development	Mixed Log-Semilog in OLS[a]	Sales prices for land zoned for single-family homes were lower per acre than for land zoned for row houses or apartments.
Downing	1970	Milwaukee, WI	Maximun units allowed per acre	Undeveloped residential land values	Crowding, distance to amenities, race & education	OLS[a]	Larger minimum lot sizes reduced the price per acre of land (permitted higher density increased land values).
Downing	1973	Milwaukee, WI	Commercial zoning	Commercial parcel sales prices	Distance from downtown, parcel size	OLS[a]	Land zoned for commercial uses was significantly more valuable than residentially zoned land.
Peterson	1974	Fairfax County, VA	Zoning (minimum lot size); also a sewer moratorium imposed in 1972	Sale price of residentially zoned parcels, 1969–73	Included interactions between zoning and other variables	OLS[a]	As distance from Washington, DC, increased, the impact of zoning restrictions on price per acre decreased. Also, by 1973, sewer moratorium impacted lot values; grandfathered, permissible sewer connection pushed lot value higher and decreased significance of other variables (including zoning).
Hushak	1975	Urban-rural boundary, Columbus, OH	Commercial zoning	1972 raw land transactions	Parcel size, distance from downtown, presence of transit links	OLS[a]	Land zoned for commercial uses was significantly more valuable than other classifications. Lot size restrictions impose artificial supply contraints.
Gleeson	1979	Brooklyn Park, MN	Growth management program	Assessors' estimates of land values for raw land and farmed parcels in developable and nondevelopable sectors of growth management map	Sewer and water service types, soil quality, zoning	OLS[a]	Segmenting of market in growth management program depressed land values in restricted areas relative to unrestricted areas. Finding was only significant as to large farmed parcels.
Gabriel and Wolch	1980	50 San Francisco Bay Area jurisdictions, CA (exclusive of	Extent of development fees and exactions, proportion of land zoned for minimum lot size of one acre, and a dummy variable indicating presence of pro-growth attitudes on city council	Home sales prices from Society of Real Estate Appraisers (city means)	Property tax rates, school finance, racial segregation in education, vacancy rates	Semilog OLS[a]	Communities with pro-growth attitudes had house values $4,200 (8% of mean home value) lower than in anti-growth communities. Higher tax rates reduced home values, while school spending and racial segregation were associated with higher prices.

[a]OLS = ordinary least squares.

Exhibit 5 (continued)

Summary of the Empirical Literature Linking Land Use Regulation and Housing Prices (pre-1990)

Author(s)	Year	Geography Covered	Regulatory Measure	Housing Price Measure	Other Variables	Type of Model	Results
Chicoine	1981	central cities) Will County, IL	Zoning classification	1970–1974 unimproved land transactions	Annexability (abutment to town boundary), septic systems, road types	OLS[a] (log-log)	Land zoned for commercial uses priced higher than parcels in other classifications.
Elliott	1981	Selected California communities	Various regulations on rate and quality of new home construction	Average housing price increases reported in mortgage banking data	Neighboring population growth, regulation imposed by surrounding county	OLS[a]	Housing prices grew faster when neighboring communities also restricted growth. Housing price increases were 35% higher in rate-controlled communities and 20% higher in quality-controlled communities than in no-control communities.
Schwartz, Hansen, and Green	1981	Petaluma, Rohnert Park, and Santa Rosa, CA	"Petaluma Plan," limiting new residential permits to 500/year and rationing them based on design features and developer-provided amenities and services to community	Reported and constructed housing prices	Size, home amenities (e.g., fireplaces, appliances)	Quasi-experimental OLS[a] with derived prices for "standard" homes	Petaluma prices rose significantly faster than one comparison city (Santa Rosa); no significant price difference found with respect to other comparison city (Rohnert Park). However, building permit activity in Rohnert Park increased.
Asabere and Colwell	1984	Champaign-Urbana, IL	Presence of single-family-only zoning	Raw land sales transactions	Time of sale, transit impacts, traffic, cul-de-sac and corner locations	Log-log OLS[a] with numerous interaction terms	Non-residentially zoned land had values 80% above average; residentially zoned land had values 50% below average.
Schwartz, Hansen, and Green	1984	Petaluma and Santa Rosa, CA	Petaluma Plan	Home sales prices from Society of Real Estate Appraisers		Simple differences in home sales volumes by price class	Sales volumes for small, low-priced homes dropped significantly below that of the Santa Rosa control group.
Black and Hoben	1985	30 MSAs[b]	Index of restrictiveness from ULI[c]; based on rankings by a panel of experts	Land prices for suburban quarter-acre and inner-ring unimproved parcels, appraised by local real estate experts (ULI[c] survey)	Growth in population, employment, and income	OLS[a] stepwise regression	Index of restrictiveness accounted for a significant amount of variation in price of developable land; significance of index's impact on lot price was unreported. Because of impacts of greenbelt restrictions on exurban sites, studies using ULI[c] land survey may understate effects of growth policies on metro fringe land prices.

[a]OLS = ordinary least squares.
[b]ULI = Urban Land Institute.

Exhibit 5 (continued)

Summary of the Empirical Literature Linking Land Use Regulation and Housing Prices (pre-1990)

Author(s)	Year	Geography Covered	Regulatory Measure	Housing Price Measure	Other Variables	Type of Model	Results
Knapp	1985	Portland area, OR	Urban growth boundaries (inner and outer ring)	455 sales of undeveloped sites zoned for single-family homes	Included variable for distance from Portland CBD[d], also lot size zoning	Hedonic price model in OLS[a]	Land outside outer boundary sold for significantly less than land inside. Mixed results for inner boundary—in affluent county, boundary was a constraint, but not in less-affluent county; lot size zoning was only significant in affluent county regressions.
Segal and Srinivasan	1985	51 large MSAs[b]	Index of growth restrictions, based on survey of metro-area planners, estimating percent of developable suburban land withdrawn from market by growth controls	Federal Home Loan Bank Board's weighted average of current dollar prices for sales of new and existing single-family homes	Mortgage rates, population and income	2SLS[e] (simultaneous supply-demand test)	Index was highly significant, explaining about 40% of variation in housing prices. Also, areas that withdrew 20% of land from development had housing price inflation of 6% compared with unrestricted cities. Growth-restricted cities had price inflation of 17% compared with unrestricted. The effect was nonlinear; cities with larger percentages of land withdrawn had higher inflation rates.
Vaillancourt and Monty	1985	Montreal suburban fringe, QC	Exclusive agricultural zoning imposed in 1978 (by provincial law)	1,200 sales of land, 1975–81	Water/sewer, location, neighborhood quality	OLS[a] semilog	Parcels subject to new zoning lost 15–30% of value compared with similar unrestricted land.
Chressanthis	1986	Lafayette and West Lafayette, IN	Adoption of unified zoning ordinance, mobile home regulation, and stringent building codes	Home sales prices from multiple listings and settlement-contract sources provided by local realtor board, covering 1960–80	Mortgage transaction costs, inflation, property tax rates	Time-series OLS[a] models incorporating adjustments for first-order serial autocorrelation, and joint estimation procedures	Adoption of unified comprehensive zoning scheme depressed prices in West Lafayette, with ambiguous effect in Lafayette itself. Mobile home regulation and building codes did not significantly affect price levels.

[a]OLS = ordinary least squares.
[b]MSA = metropolitan statistical area.
[d]CBD = Central Business District.
[e]2SLS = two-stage least squares.

Exhibit 5 (continued)

Summary of the Empirical Literature Linking Land Use Regulation and Housing Prices (pre-1990)

Author(s)	Year	Geography Covered	Regulatory Measure	Housing Price Measure	Other Variables	Type of Model	Results
Mark and Goldberg	1986	Two neighborhoods in Vancouver, BC: one affluent, one poor	Three zoning-related measures: zoning of the home itself, nearby land uses that might affect value of home, and whether a rezoning occurred, 1957–1980	Sale price of single-family homes, 1957–80	Age of home, number of rooms, and lot size	OLS[a]; seperated regressions for affluent and poor neighborhoods and for each of the 23 years	Effects of zoning and land use variables are inconsistent over time; they vary in sign, magnitude, and significance.
Zorn, Hansen, and Schwartz	1986	Davis, CA, and three control suburbs: Woodland, Roseville, and Rancho Cordova, CA	Before-after adoption of building permit allocation scheme encompassing inclusionary requirements	House sales prices from Society of Real Estate Appraisers	Condition, age and quality of home; property tax assessments	Hedonic price model in OLS[a] stratifying sample by before-after variable and jurisdiction	Prices under growth control grew more rapidly than those in control sample. Price-mitigating aspect of regulation reduced net effect on affordability.
Katz and Rosen	1987	64 communities in San Francisco Bay Area, CA	Location within jurisdiction with building permit moratorium or rationing system in effect for at least 1 year during study period	Home sales prices from Society of Real Estate Appraisers	Density, local public spending, home quality characteristics	Hedonic semilog OLS[a]	House prices in growth-controlled communities 17.3% higher. Authors observe results may be driven by low proportion of sales-sample in regulated jurisdictions (11%) or by higher-priced places having preferences for regulation.
Chambers and Diamond	1988	30 MSAs[b]; updated data from same sample used by Black and Hoben	Index of restrictiveness from a ULI[c] survey based on rankings by a panel of experts, delay time, and general availability of zoned lots	Price of a standard quarter-acre suburban lot zoned for single-family and price of unimproved acreage near developing fringe of metro area suitable for single-family development; both obtained from ULI[c] survey of local real estate experts		OLS[a] stepwise regression	Mixed results, but authors conclude that delay and zoning did increase land prices.

[a]OLS = ordinary least squares.
[b]MSA = metropolitan statistical area.
[c]ULI = Urban Land Institute.

Exhibit 5 (continued)

Summary of the Empirical Literature Linking Land Use Regulation and Housing Prices (pre-1990)

Author(s)	Year	Geography Covered	Regulatory Measure	Housing Price Measure	Other Variables	Type of Model	Results
Nelson	1988	Portland area, OR	Urban growth boundaries	Vacant land sales	Waterfront location, view, soil quality, location	Hedonic log-log OLS[a]	Confirms Knapp's (1985) results; showing that greenbelt boundary resulted in high land values near Portland, low values in greenbelt, and high values in exurban sector.
White	1988	Ramapo, NY	Zoning regulations (minimum lot size)	Tax assessor reports of 200 sales of vacant lots zoned for residential use, 1977–80	Neighborhood location, summary negative externality dummy, local amenities index, adjacent home values (structure only)	Log-log OLS[a] with numerous interaction terms	Subdivision-cost effect accounted for 25% of difference in sale price for quarter-acre and 1-acre lots; zoning accounted for 3/4 of difference (1-acre lots sold for less per ft^2). According to Fischel (1990), lot-size restrictions mimicked growth management scheme, so that reported cost effects should be considered lower-bound estimate.
Cheshire and Sheppard	1989	Darlington and Reading, UK	Comparison of the two cities—Darlington being the least restrictive and Reading the most—based on planning applications, acceptances, and appeals	Asking sale prices (from real estate agents) and sample survey of households	Structural characteristics of housing, school districts, and proximity to transportation and countryside amenities	Hedonic price function OLS[a]	House price-to-income ratio for four housing types was consistently higher in Reading than Darlington. Reading's policies area estimated to increase housing prices by 2.3–17.3% (depending on housing type and distance from city center), with the highest impact of policies on low-density dwellings close to city center (older units), and the lowest impact on higher density development far from center (newer units), which the authors attribute to developers' ability to change housing type in response to restrictions.
Rose	1989	MSAs[b]	Index of potential monopoly in metro areas (e.g., number of local governments); based on Hamilton (1978)	Developable land prices—from ULI[c] survey and FHA[f] data	Included variables to account for existence of natural barriers to development	OLS[a]	About 10% of variation in intermetro land prices is accounted for by index of potential monopoly; natural barriers accounted for 30% of variation.

[a]OLS = ordinary least squares.
[b]MSA = metropolitan statistical area.
[c]ULI = Urban Land Institute.
[f]FHA = Federal Housing Administration.

Exhibit 5 (continued)

Summary of the Empirical Literature Linking Land Use Regulation and Housing Prices (pre-1990)

Author(s)	Year	Geography Covered	Regulatory Measure	Housing Price Measure	Other Variables	Type of Model	Results
Spreyer	1989	Houston, TX (which has no zoning) and nearby municipalities (which do)	Three categories: zoned, unzoned but covenanted (mainly Houston properties), or unzoned and uncovenanted	House values for single-family homes	Location, amenities, home size and quality	OLS[a]	Unzoned but covenanted land (in Houston) had values not statistically different from properties in zoned cities, but properties that were unzoned and uncovenanted had values less than those in the other two categories. The results indicate that covenants are an alternative to zoning in relatively undeveloped areas where developers can acquire and impose covenants on large areas of land; i.e., a larger transaction cost exists for covenants in developed areas.

[a]OLS = ordinary least squares.

Exhibit 6

Summary of the Empirical Literature Linking Land Use Regulation and Housing Prices (post-1989)

Author(s)	Year	Geography Covered	Regulatory Measure	Housing Price Measure	Other Variables	Type of Model	Results
Cho	1991	10 magistral districts of Fairfax County, VA	Percent land vacant, zoning restrictiveness index, use restrictiveness index (ratio of land designated for residential use to that designated for commercial use), relative zoning restrictiveness of adjacent areas, and relative use restrictiveness of adjacent areas	Housing price indexes constructed from transaction prices and structural characteristic data collected by the county	Real per capita income, distance to Federal Triangle (in Washington, DC), change of housing price index over 2 years, and population density	OLS[a]	Impact of vacant land measure was negative in sign but not significant; all four restrictiveness indexes had significantly positive impacts on housing price, indicating an increase in housing prices due to both intradistrict restrictiveness and the spillover effects of nearby jurisdictions.
Pollakowski and Wachter	1990	17 planning areas that constitute Montgomery County, MD	Percent land vacant, development ceiling, zoning restrictiveness index of vacant and developed land, and relative restrictiveness of adjacent planning areas	Longitudinal housing price indexes for the 17 planning areas	Real per capita income, distance to Federal Triangle, gravity employment index, real mortgage rate, and real construction cost index	OLS[a]	The index of vacant land and the development ceiling had negative but not significant impacts on housing price. Restrictiveness index had a positive significant impact (price elasticity: 0.275). Housing prices in districts adjacent to more restrictive districts were higher (price elasticity: 0.093). The authors interpret the results as a spillover effect of zoning, caused by scarcity in restrictive districts.
Malpezzi	1996	MSAs[b]	Two aggregated indexes: one composed of variables from the Wharton study and the other from AIP[c] state regulatory variables	Median contract rent and median house value from the 1990 Census	Natural geographic constraints, demographic variables, and a rent control dummy	OLS[a]	For rents, only the state regulatory index was significant (and positive), but for house values, both aggregated indexes were significant. The impact (increase in rent/value) of moving from lightly to heavily regulated environment is estimated to be 17% for rents and 51% for house values.
Mayo and Sheppard	1996	Malaysia, Thailand, and South Korea (country-level)	Comparison of the three countries that have varying levels of restrictiveness: South Korea is the most restrictive; Thailand, the least; and Malaysia is intermediate	Housing price indexes for each country	Income, factor prices for housing production, and the price of other goods	OLS[a] and autoregressive least squares to find price elasticity of supply for housing. Also uses a recursive model to estimate the change in price over time.	Malaysia and Korea had low elasticities of supply, and Thailand had a high elasticity. Recursive model showed that although Korea and Thailand were relatively stable over time, Malaysia had a high elasticity in the years immediately after adoption of more restrictive planning system, but over time supply became less elastic.

[a]OLS = ordinary least squares.
[b]MSA = metropolitan statistical area.

Exhibit 6 (continued)

Summary of the Empirical Literature Linking Land Use Regulation and Housing Prices (post-1989)

Author(s)	Year	Geography Covered	Regulatory Measure	Housing Price Measure	Other Variables	Type of Model	Results
Thorson	1996	10 urbanized areas in the Northeast United States	The zoning "concentration ratio"—a measure of monopoly zoning—which is the proportion of suburban land controlled by the four largest suburban governments, as presented in Fischel (1981) and Rose (1989)	Median housing value for each town with population over 10,000 (from 1970, 1980, and 1990 Census years), adjusted for regional differences in cost	A number of variables to reflect town characteristics, including population, competing land use prices, and amenities	OLS[a]	Concentration ratio had a positive significant impact on housing value.
Malpezzi and Mayo	1997	Malaysia, Thailand, and South Korea (country-level)	In cost-benefit analysis of Malaysia, considered its regulatory environment: strict land use and infrastructure standards (road size, setback, community facilities requirements), approval procedures, and requirements for construction of low-cost units. Malaysia was also compared with Thailand (less restrictive) and South Korea (similar restrictiveness).	National housing price indexes	Similar to Mayo and Sheppard (1996)	Cost-benefit model using present value analysis and model similar to Mayo and Sheppard (1996) for the three-country comparison	The cost-benefit analysis indicates that interventions add about $4,000 (Malaysian) to developers' cost. The cross-country comparison indicates that Malaysia and Korea have inelastic housing supply curves and Thailand has an elastic curve, similar to the United States.
Malpezzi, Chun, and Green	1998	MSAs[b]	Two aggregated indexes: one composed of variables from the Wharton study and the other from AIP[c] state regulatory variables; these indexes are used in first stage of 2SLS[d]	Rent and house value variables determined by hedonic modeling of Census PUMS[e] data	Natural geographic constraints, demographic variables, and a rent control dummy.	Linear and quadratic 2SLS[d]	For both dependent variables, the linear specifications show positive and significant results for the instrumental regulatory index, with coefficients ranging from 0.02 to 0.08. The effect of moving from less stringent to more stringent regulation is estimated to be a 13–26% increase in rents or a 32–46% increase in asset prices for the quadratic models, and 9–16% and 31–46% increases, respectively, for the linear models.
Green	1999	Waukesha County, WI (39 municipalities)	Six regulatory variables (zoning and permitting) constructed from a University of Wisconsin survey of land use controls in the county (municipal level)	Median housing prices and rents from 1990 Census (at tract level)	1990 tract level demographic and economic information from Census	OLS[a]	Two of the regulation variables had a positive, significant impact on housing prices; not permitting mobile homes increased prices by 7–8%, and an additional 10 feet of required frontage increased prices by 6–8%. Only the subdivision requirement for curbs and gutters had a significant impact on rents, increasing them by 10–12%. Both frontage requirements and mobile home permitting also had a positive significant impact on the share of housing that was affordable.

[a]OLS = ordinary least squares.

[d]2SLS = two-stage least squares.

Exhibit 6 (continued)

Summary of the Empirical Literature Linking Land Use Regulation and Housing Prices (post-1989)

Author(s)	Year	Geography Covered	Regulatory Measure	Housing Price Measure	Other Variables	Type of Model	Results
Monk and Whitehead	1999	Three districts outside London, UK	Comparison of the three districts that have varying levels of restrictiveness; Fenland has little restriction, and both North Hertfordshire and South Cambridgeshire have significant restriction	Land prices, housing production, and house prices		Comparative statics	Land prices were higher in the most constrained areas, but the change in prices was similar between the least restrictive (Fenland) and the less restrictive of the constrained cases (South Cambridgeshire). All saw increases in housing prices which did not seem to be affected by the level of constraint.
Mayer and Somerville	2000	44 MSAs[b]	(1) Number of months for subdivision approval, (2) number of growth management techniques (in MSA[b]), and (3) whether use development fees are imposed (all from the Wharton Urban Decentralization Project survey)	Supply measure—the quarterly number of number single family building permits	Quarterly changes in house prices (from repeat sale price index, including lags for 5 periods); change in real prime rate; time trend for each city; and 1980 population	Four types: OLS[a], GLS[f], PCSE[g], and IV[h] quasi-differential	Regulation has a consistently negative effect on steady-state level of construction, with housing starts estimated to be 45% lower in cities with more regulation. Although delays in the approval process and number of management techniques both had negative significant impacts, development fees did not show a significant effect. Modeling the dynamic effects indicates that more highly regulated MSAs[b] have price elasticities that are more than 20% lower than in less regulated cities.
Phillips and Goodstein	2000	37 MSAs[b] and primary MSAs[b]	Number of municipalities (proxy for regulation as per Ozanne and Thibodeau [1983]); and regulatory index as constructed by Malpezzi (1996). Also considered impact of Portland, OR's UGB[i] by giving it the highest index value in some models.	Median housing price	Population, median income, unemployment rate, construction cost index	OLS[a]	Regulation index has a positive significant effect, and weak evidence indicates that the UGB[i] has increased median housing prices, but impact is low (less than $10,000 per unit).
Downs	2002	86 major MSAs[b] (including Portland, OR)	Dummy variable for Portland's UGB[i] adopted in 1979	NAR[j] median-price series and Freddie Mac price index for repeat sales Rent and house	City and population characteristics	OLS[a] for five panels between 1990 and 2000	For 1994–2000 and 1996–2000 periods, UGB[i] had no significant impact on the change in housing prices, but during 1990–2000, 1990–94, and 1990–96, the effect was positive and statistically significant. UGB[i] alone does not increase housing prices, but the UGB[i] combined with factors stimulating demand for housing (e.g., an increase in population or income) can increase prices.

[a]OLS = ordinary least squares.
[b]MSA = metropolitan statistical area.
[f]GLS = generalized least squares.
[g]PCSE = panel corrected standard errors.
[h]IV = independent variable.
[i]UGB = urban growth boundary.
[j]NAR = National Association of REALTORS®.

Exhibit 6 (continued)

Summary of the Empirical Literature Linking Land Use Regulation and Housing Prices (post-1989)

Author(s)	Year	Geography Covered	Regulatory Measure	Housing Price Measure	Other Variables	Type of Model	Results
Malpezzi	2002	MSAs[b]	Two aggregated indexes: one composed of variables from the Wharton study and the other from AIP[c] state regulatory variables	value variables determined by hedonic modeling of Census PUMS[e] data and 2000 NAR[i] median, existing house sale price (for more recent data)	Same as Malpezzi, Chun, and Green (1998), but also included "high-tech locational quotient" in the second stage regression	2SLS[d]	Regulation has a positive, significant impact when using two different measures of housing prices: the hedonic index constructed in MCG[k] and the 2000 NAR[i] median existing house sale price (coefficients of 0.085 and 0.068, respectively).
Gyourko and Glaeser	2003	Central cities of 45 MSAs[b]	From the Wharton Land Use Control Survey; measure is an index (ranging from 1 to 5, 1 being brief) indicating the average length of time between an application for rezoning and the issuance of a building permit	Share of the city's housing stock priced more than 40% above the cost of new construction (constructed from the AHS[l] data and RS Means estimation of construction costs)	Population growth and median income	OLS[a]	A unit increase in the index indicates 15% more of the stock priced at more than 40% more than the cost of new construction. When controlling for population growth and median income, the relationship is still positive and significant, although the impact has a lower magnitude. The authors also consider the impact of the zoning measure on the implicit zoning tax (as calculated using AHS[l] data), and find a significant positive result, indicating a nearly $7/ft.^{2} price increase per unit increase in the regulatory index.

[a]OLS = ordinary least squares.
[b]MSA = metropolitan statistical area.
[c]AIP = American Institute of Planners.
[d]2SLS = two-state least squares.
[e]PUMS = public-use microdata sample.
[i]NAR = National Association of Realtors®.
[k]MCG = Metropolitan Consulting Group.
[l]AHS = American Housing Survey.

Perhaps the most important reason why empirical research is not definitive is the difficulty of measuring the regulatory environment facing households and builders in a satisfactory manner. As we suggested in the section on taxonomies of land use regulation, statutory regulations vary along a variety of dimensions, and the enforcement of these rules may vary systematically. As exhibit 5 indicates, important and unresolved issues of measurement exist in characterizing local land use regulation across jurisdictions. Thus, much of the research reported in exhibit 6 is based on observing natural experiments provided by the regulatory environment of a single city or perhaps a single neighborhood in a city.

Accordingly, we believe that the most promising strategy for improving our understanding of the economic effects of zoning and land use restrictions would be to devote resources to measuring regulatory conditions systematically in a large cross-section of cities and metropolitan areas. At least two precedents exist for measuring regulations through a broad cross-section survey of regulations and behavior. Glickfeld and Levine (1992) designed and implemented two successive surveys (Levine, 1999) of land use restrictions and planners' proclivities in California. These surveys elicited high response rates, in part due to close collaboration among the authors, the League of California Cities, and the California State Association of Counties. Appendix A contains the instrument from the first survey conducted by these authors.

The 1992 Glickfeld and Levine survey reported detailed information on the revenues and expenditures of each jurisdiction in California, documenting the types and magnitudes of public revenues and the capital outlays and operating expenses made by governments. The survey also documented expenditures by category for each jurisdiction. The heart of Glickfeld and Levine's study, however, is two sets of questions: one posed to land use officials about the importance of public incentives in fostering growth and the other designed to document the regulatory environment in each city. Researchers have used the survey to analyze regional housing production (Levine, 1999), the regional distribution of single-family and multifamily housing (Glickfeld and Levine, 1992), residential segregation (Rosenthal, 2000), and changes in demographic conditions in California cities (Quigley, Raphael, and Rosenthal, 2004).

In another example, Linneman and his associates at The Wharton School (Buist, 1991; Linneman et al., 1990) designed a survey that was administered across a broad cross-section of municipalities, with the cooperation of the International City Managers Association. The Wharton survey asked local officials their opinions about factors affecting the development process and the management of economic growth. This survey also asked officials about the presence and magnitudes of impact fees and exactions and posed a companion set of questions to county officials. The survey resulted in a profile of about 1,000 local jurisdictions and the counties in which they were located.

Linneman and Summers (1993, 1999) used the Wharton survey to analyze patterns of decentralization in the United States. Malpezzi (1996) generalized the determinants of a summary index of the detailed Wharton measures. This "Malpezzi Index" of land use regulation was used to characterize the regulatory environment across U.S. metropolitan areas in 1999. This generalization has proven valuable in characterizing and comparing regulatory environments. For example, Malpezzi, Chun, and Green (1998) used these measures to explore the determinants of variations in house prices across the metropolitan areas, and Greulich, Quigley, and Raphael (2004) used them to analyze the effects of immigration on housing prices. More recently, Mayer and Somerville (2000) utilized several items from the Wharton survey in models explaining variable issuance of building permits across metropolitan areas. These authors concluded that regulatory stringency in the form of approval delays and growth management measures reduces the supply of new single-family units and corresponding price elasticities (see also Gyourko and Glaeser

2003 [utilizing a Wharton-based index to show upward pressures on an implicit zoning tax the authors base on American Housing Survey data]). Appendix B includes the original Wharton survey instrument.

We believe that a systematic update and extension of this work would have a high social and scientific payoff. Note that we are proposing a research program, not merely a measurement effort. As described by Malpezzi and his colleagues, and as is surely well known to the authors of these two comprehensive planning and regulatory surveys, many unresolved issues arise in the design of a survey instrument and the characterization of a regulatory environment that spans local governments in different states. But the wide variation in regulation that could be measured in a national survey would be invaluable in assessing the effects of these differences on housing outcomes and prices in U.S. metropolitan areas.

In our view, a useful survey of local land use regulation would have four components. First, the survey would be national with representation from stagnating as well as growing regions and large and small political jurisdictions. Second, it would sample metropolitan areas and localities to permit analysis of the interplay among political jurisdictions and between localities and regional authorities. Third, such a survey would measure the outcomes of regulatory processes at the local level. Fourth, it would sample builders, developers, and government officials to establish, as far as possible, the linkage between regulation on the one hand and the supply and price of housing on the other.

Ideally, the lessons learned from developing a survey of regulation could be implemented in revising and extending the ways in which residential construction and building permits are reported through the U.S. Census Bureau. Currently, the Census Bureau requires annual reporting of residential building permits. (Residential building permits are reported on form C-404, which is included with other construction-census instruments in Appendix C.) Modest changes to these reporting requirements may provide a body of data that could be valuable in measuring the linkages between restrictive regulations, the enforcement of regulations, and the cost of housing across the United States.

Acknowledgments

This research is supported by a grant from the U.S. Department of Housing and Urban Development and by the Berkeley Program on Housing and Urban Policy. The authors wish to acknowledge the helpful research assistance of Sarah Dunn.

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Notes

1. This section draws, in part, on materials compiled by Dwyer and Menell (1998).

2. The trilogy of Mount Laurel decisions is *Southern Burlington County NAACP v. Township of Mount Laurel*, 67 N.J. 151, 336 A.2d 713, appeal dismissed and cert. denied,

423 U.S. 808 (1975) (referred to as "Mount Laurel I"); *Southern Burlington County NAACP v. Township of Mount Laurel*, 92 N.J. 158, 456 A.2d 390 (1983) ("Mount Laurel II"); and *Hills Dev. Co. v. Township of Bernards*, 103 N.J. 1, 510 A.2d 621 (1986) ("Mount Laurel III").

3. Historically, urban containment was also intended to keep inferior public health conditions from migrating toward the suburbs (Simmie, Olsberg, and Tunnell, 1992).

4. A review by Fischel (1992) opined that the stability and pervasiveness of fiscally driven land use regulatory regimes was strong evidence of their overall efficiency. According to this point of view, studies showing strong upward pressures on home price due to land use restrictiveness are entitled to a presumption of validity.

5. Viewed in Coasean terms, zoning is not the only technique by which the fiscal externality can be incorporated into an efficient pricing mechanism. Instead of assigning the property right ab initio to the S residents, society can just as easily assign it in the first instance to the L residents desiring entrance. So long as Coasean bargaining requirements are fulfilled concerning the necessary transfers, the efficient level of L housing in S zones will still be attained (Fischel, 1985). Such a reassignment of initial property rights undermines judicial efforts to undo zoning regimes deemed overly "exclusionary" (for example, Kirp, Dwyer, and Rosenthal, 1995).

6. Some argue, however, that discriminatory fiscal policies alone, in the absence of land controls, segregate neighborhoods by income through the voluntary actions of individual households (Epple and Plant, 1998).

7. Known as the "taxpayer revolt" initiative passed by the voters in 1978, California's famed Proposition 13 slashed property tax revenues by setting a 1-percent maximum tax rate, rolling back assessable values to 1975 levels, limiting tax-bill increases to 2 percent per year, and allowing reassessment only when property changes hands. Proposition 13 also required a two-thirds legislative vote for state tax increases.

8. The discussion that follows makes use of an excellent survey of the early literature by Fischel (1990).

9. Perceptions of real estate experts, such as those relied on by Black and Hoben (1985) and Chambers and Diamond (1988), seem inherently remote and subjective. The relative merit of such indicators, however, comes from careful comparison to the often clumsy attempt to translate more thorough, sophisticated surveys of regulatory behavior into useful summary indices.

10. A previous Petaluma study by the same authors showed an average housing cost increase of 8 percent over Santa Rosa due to the regulation (Schwartz, Hansen, and Green, 1981). The earlier paper also provided useful background on the federal legal challenge brought by the housing industry against Petaluma's growth control ordinance. The trial court in San Francisco held that the permit cap effectively prohibited entry by would-be residents of the town, thereby infringing on their constitutionally protected right to travel. In 1975, the U.S. Court of Appeals for the Ninth Circuit reversed this decision in *Construction Industry Association v. City of Petaluma*, holding that plaintiff builders and landowners lacked standing to raise the right to travel claim on behalf of outsiders (*Construction Industry Association v. City of Petaluma*, 375 F. Supp. 574 (N.D. Cal. 1974), *rev'd on other grounds*, 522 F.2d 897 (9th Cir. 1975), *cert. denied*, 424 U.S. 934 [1976]).

11. The Petaluma Plan did assign positive "beauty contest" points for multifamily units, and this factor was deemed important by federal judges reviewing the scheme. Because the addition of symbolic inclusionary features helped Petaluma's growth control ordinance withstand constitutional muster, other growth-restricting communities around the country used similar tactics (Fischel, 1992: 222; Ellickson, 1981).

12. An even more ambitious approach was suggested by Navarro and Carson (1991), who added to the land-use analytical agenda the following list of collateral issues:

    - Degree of "spillover" effects into neighboring jurisdictions in the region.
    - Degree of subsidization of growth by incumbents.
    - Rates of development and population growth consistent with the city's ability to provide facilities and infrastructure.
    - Extent of "doubling up" (i.e., overcrowding).
    - Link between rates of job creation and population growth.
    - Efficiency properties of various commercial and industrial growth controls.
    - Target rate of job creation.
    - Effect of differing rates of population growth on tax base and per capita income.
    - Effectiveness of various affordable housing provisions.

13. The repeat-sales housing price index adjusts for the quality imbalance biases inherent in simple means and medians, given the infrequency of transactions and the shift in the composition of sales over time (Bailey, Muth, and Nourse, 1963; see Redfearn and Rosenthal, 2001).

14. Additional evidence of interjurisdictional effects in the Washington, D.C. metropolitan area may be found in work by Wachter and Cho (1991).

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Appendix A: Glickfeld/Levine Survey

League of California Cities
1400 K STREET • SACRAMENTO, CA 95814 • (916) 444-5790

Sacramento, CA.
November, 1988

TO: City Managers (City Clerks in Non-Manager Cities)

RE: SURVEY ON LOCAL GROWTH CONTROL AND GROWTH MANAGEMENT MEASURES

The League of California Cities is sending this survey on local growth control and growth management measures to all cities in the state. The results will provide a database that describes the scope and nature of growth control and growth management measures being undertaken in local jurisdictions in California. This data base will be used to assist individual cities now considering growth control and growth management measures by providing information on the types and impacts of such measures. This information will also be considered by the League's Growth Control Task Force in developing policies on growth control and growth management. In addition, we anticipate that the next legislative session will be focused on growth control and growth management restrictions.

This survey asks for information on all growth control or growth management measures undertaken in your jurisdiction, whether adopted as an ordinance by the city council or through the initiative ballot process. While people may have different definitions of growth control and growth management measures, for the purposes of this questionnaire such measures are those that control the rate, intensity, type and distribution of development in the jurisdiction.

We would like you to identify measures that are applicable citywide, or have an impact on the entire jurisdiction even though it may be limited to a particular geographical area. Advisory measures, short-term restrictions (such as a zoning moratorium to prepare a community plan), single site or project restrictions which do not have a jurisdictionwide effect, or measures which are no longer in effect should be excluded.

Only one survey per jurisdiction should be completed. Please have the staff person who is the most knowledgeable on the purpose, content and impacts of your city's growth control and growth management measures complete this survey. In many jurisdictions, the Planning Director would probably be the appropriate person.

Please fill out and return this survey even if you do not currently have any growth control or growth management measures. It is extremely important that every jurisdiction respond to this survey. We apologize for the length of this survey, but please respond to all of the questions. Please return this survey as soon as possible, but no later than December 30.

Thank you for your assistance. The results of this survey should be available in February, 1989.

Appendix A: Glickfeld/Levine Survey (continued)

LEAGUE OF CALIFORNIA CITIES
SURVEY ON GROWTH CONTROL

RETURN BY DECEMBER 30.

GENERAL INFORMATION

1. NAME OF JURISDICTION: _____

2. NAME OF RESPONDENT: _____

3. TITLE OF RESPONDENT: _____

4. POPULATION: not coded;replaced with standardized data

5. GEOGRAPHIC LOCATION: not coded; replaced with standardized data

Check one of the following:

a._____	Northern Coastal	g._____	Central Inland
b._____	Northern Foothill/Mountain	h._____	Central Desert
c._____	Northern Inland	i._____	Southern Coastal
d._____	Northern Desert	j._____	Southern Foothill/Mountain
e._____	Central Coastal	k._____	Southern Inland
f._____	Central Foothill/Mountain	l._____	Southern Desert

6. DEVELOPMENT CHARACTER

Check one of the following that describes the character of your city:

a._____ Urban/Suburban b._____ Rural

7. GROWTH DEMAND

Check one of the following that best fits your city:

a._____ There is a strong market demand for housing development in our jurisdiction.

b._____ There is a strong market demand for commercial and industrial development in our jurisdiction.

c._____ Both a. and b..

d._____ There is a lack of a strong demand for growth in our jurisdiction.

e._____ Other (Please Explain)_____

_____.

Appendix A: Glickfeld/Levine Survey (continued)

8. PLANNING DOCUMENT STATUS

Please check below all applicable statements regarding the status of your city's required planning documents.

a._____ Our general plan is complete (i.e., includes all state mandated elements).
Please note year of adoption:_____

b._____ We are currently in the process of updating our general plan.

c._____ We are currently in the process of updating one or more state mandated general plan elements.

not coded d._____ Our general plan is incomplete or over 10 years old.

e._____ We have asked for or received a general plan extension from the State Office of Planning and Research.

f._____ We have adopted a general plan growth management element or are currently developing such an element.

not coded g._____ Our housing element is complete and finally adopted.
Please note year of adoption:_____.

not coded h._____ We only have a draft housing element.

not coded i. According to the State Department of Housing, Community Development (HCD), our adopted housing element has been deemed:

(1)_____ In compliance. (2)_____ Out of compliance.

(3)_____ Obsolete (4)_____ No determination/unknown.

not coded j. According to HCD, our draft housing element has been deemed:

(1)_____ In compliance. (2)_____ Out of compliance.

(3)_____ Obsolete. (4)_____ No determination/unknown.

- -

II. RESIDENTIAL GROWTH CONTROL AND GROWTH MANAGEMENT MEASURES

9. POPULATION GROWTH LIMITATIONS

Does your city have a measure* which establishes a population growth limit or restricts the level of population growth for a given time frame (i.e., annual basis)?

**"Measure" includes initiatives adopted by the voters or regulatory ordinances adopted by the city council. It excludes resolutions or other policy statements.*

Appendix A: Glickfeld/Levine Survey (continued)

a._____ YES b._____ NO

If YES, adopted by (1)_____ initiative or (2)_____ ordinance.
(3)_____ year enacted.

10. HOUSING PERMIT LIMITATIONS

Does your city have a measure which restricts the total number of permitted residential building permits in a given time frame (i.e., annual basis) for:

a._____ YES b._____ NO

If YES, applies to (1)_____ single family or (2)_____ multiple family or (3)_____ both

If YES, total # of permitted units:(4) _____ per (5)_____.

If YES, adopted by (6)_____ initiative or (7)_____ ordinance.
(8)_____ year enacted.

11. HOUSING INFRASTRUCTURE REQUIREMENTS

Does your city have a measure which specifically requires adequate service levels (i.e., road capacity/traffic congestion) or service capacity (i.e., water, sewers, etc.) prior to or as a condition of approval of a residential development?

a. _____ YES b. _____ NO

If YES, adopted by (1)_____ initiative or (2)_____ ordinance.
(3)_____ year enacted.

12. HOUSING DENSITY AND LOCATIONAL RESTRICTIONS

Does your city have a measure which did any of the following (check all applicable responses):

a._____ Reduced the permitted residential density by general plan amendment or rezoning.

Applicable to: (1)_____ Entire City or (2)_____ Part of City
Adopted by: (3)_____ initiative or (4)_____ ordinance.
Year enacted: (5)_____.

b._____ Requires voter approval to increase residential densities.

Applicable to: (1)_____ Entire City or (2)_____ Part of City
Adopted by: (3)_____ initiative or (4)_____ ordinance.
Year enacted: (5)_____.

c._____ Requires super majority council vote to increase residential densities.

Appendix A: Glickfeld/Levine Survey (continued)

Applicable to: (1)_____ Entire City or (2)_____ Part of City
Adopted by: (3)_____ initiative or (4)_____ ordinance.
Year enacted: (5)_____.

d._____ Redesignated or rezoned land previously designated for residential development to agriculture or open space (i.e., hillside or ridge preservation).

Adopted by: (1)_____ initiative or (2)_____ ordinance.
(3) _____ year enacted.

IF YOU ANSWERED YES TO QUESTIONS 9, 10, OR 11, OR CHECKED A RESPONSE TO QUESTION 12, PLEASE ANSWER THE FOLLOWING QUESTIONS 13 - 15. IF YOU ANSWERED NO OR DID NOT CHECK A RESPONSE TO QUESTIONS 9-12, GO TO QUESTION 16.

13. PURPOSES OF RESIDENTIAL GROWTH CONTROL AND GROWTH MANAGEMENT MEASURES

Please check all of the applicable purposes for all of your city's residential growth control or growth management measures as listed below:

a._____ Air Quality
b._____ Water Quality
c._____ Agricultural Land Preservation
d._____ Open Space/Ridgeline Preservation
e._____ Limitation of Urban Sprawl
f._____ Preservation of Sensitive Environmental Areas
g._____ Reduction in Traffic Congestion
h._____ Sewer Capacity Limitations
i._____ Water Quantity Limitations
j._____ Rapid Population/Housing Growth
k._____ Quantity of High Density Housing Developments
l._____ Quantity of Low Income Housing Developments
m._____ Quality of Life Preservation
n._____ Other: (please specify)_____
o._____ Information not available
p._____ Not applicable - no residential growth control or growth management measures

14. IMPACTS OF RESIDENTIAL GROWTH CONTROL AND GROWTH MANAGEMENT MEASURES

Please check all of the applicable impacts of all of your city's residential growth control or growth management measures as listed below:

a._____ Increase in housing costs above inflation rates.
b._____ Reduction in the historical level of new housing development.
c._____ Increase in average commute distances.
d._____ Increase in traffic levels/congestion.
e._____ Decrease in projected traffic levels/congestion.
f._____ Reduction in projected population levels.
g._____ Other. (Please specify):_____
_____
h._____ Information not available.

Appendix A: Glickfeld/Levine Survey (continued)

15. LOW-MODERATE INCOME HOUSING EXEMPTIONS

Does your city exempt low and/or moderate income housing units (i.e., affordable to families with an income of 120% or less of the median) from application of your residential growth control/growth management measures?

a._____ YES. b._____ NO. c._____ Not applicable - no residential growth control or growth management measures.

16. LOW-MODERATE INCOME HOUSING INCENTIVES

Does your city provide any incentives (i.e., density bonus, financial subsidies, etc.) for construction of low and/or moderate income housing units?

a._____ YES. b._____ NO.

If YES, please specify: _____

_____.

- -

III. COMMERCIAL AND/OR INDUSTRIAL GROWTH CONTROL AND GROWTH MANAGEMENT MEASURES

17. SQUARE FOOTAGE LIMITATIONS

Does your city have a measure that restricts the amount of square footage that can be built within a given time frame for:

a. Commercial (i.e., retail and office): (1)_____ YES (2)_____ NO

If YES, applicable to: (3) _____ Entire City or (4)_____ Part of City
If YES, adopted by: (5)_____ initiative or (6)_____ ordinance
(7) _____ year enacted.

b. Industrial (light industrial/warehouse): (1)_____ YES (2)_____ NO

If YES, applicable to: (3) _____ Entire City or (4)_____ Part of City.
If YES, adopted by: (5) _____ initiative or (6) _____ ordinance
(7) _____ year enacted.

18. COMMERCIAL/INDUSTRIAL INFRASTRUCTURE REQUIREMENTS

Does your city have a measure that specifically requires adequate service levels (i.e., road capacity/traffic congestion) or service capacity (i.e., water, sewer, etc.) prior to or as a condition of approval of commercial and/or industrial development?

a._____ YES b._____ NO

If YES, adopted by: (1)_____ initiative or (2)_____ ordinance
(3)_____ year enacted.

Appendix A: Glickfeld/Levine Survey (continued)

19. COMMERCIAL/INDUSTRIAL LOCATIONAL RESTRICTIONS

Does your city have a measure which redesignated or rezoned land previously designated for commercial and/or industrial development?

a._____ YES b._____ NO

If YES, applicable to: (1) ____ Entire City or (2) ____ Part of City.
If YES, adopted by: (3)_____ initiative or (4)_____ ordinance
(5)_____ year enacted.
If YES, redesignated to: (6)_____ residential (7)_____ agriculture
(8)_____ other, Specify:_____

20. COMMERCIAL BUILDING HEIGHT LIMITATIONS

Does your city have a measure adopted within the last 5 years, which restricts the permitted height of commercial/office buildings?

a._____ YES b._____ NO

If YES, applicable to: (1)___ Entire City or (2)___ Part of City.

If YES, adopted by: (3)_____ initiative or (4)_____ ordinance
(4)_____ year enacted.

IF YOU ANSWERED YES TO QUESTIONS 17, 18, 19 OR 20, PLEASE ANSWER THE FOLLOWING QUESTIONS 21 - 22. IF YOU ANSWERED NO, GO TO QUESTION 23.

21. PURPOSES OF COMMERCIAL AND/OR INDUSTRIAL GROWTH CONTROL AND GROWTH MANAGEMENT MEASURES

Please check all of the applicable purposes for all of your city's commercial/industrial growth control or growth management measures as listed below:

a._____ Air Quality Preservation
b._____ Water Quality Preservation
c._____ Agricultural Land Preservation
d._____ Open Space Preservation
e._____ Limitation of Urban Sprawl
f._____ Preservation of Sensitive Environmental Areas
g._____ Reduction in Traffic Congestion
h._____ Sewer Capacity Limitation
i._____ Water Quantity Limitation
j._____ Quality of Life Preservation
k._____ Other (please specify):_____
l._____ Information Not Available
m._____ Not applicable -- no commercial/industrial growth control or growth management measures.

22. IMPACTS OF COMMERCIAL/INDUSTRIAL GROWTH AND GROWTH MANAGEMENT MEASURES

Please check below all of the applicable impacts of all of your city's commercial/industrial growth control or growth management measures as listed below:

Appendix A: Glickfeld/Levine Survey (continued)

a.______ Increase in the average commute distance
b.______ Increase in traffic levels/congestion
c.______ Decrease in projected traffic levels/congestion
d.______ Reduction in the historical level of new commercial/industrial development.
e.______ Loss of projected new commercial, office or industrial developments/employers
f.______ Reduction in projected employment levels
g.______ Reductions in projected sales tax revenues
h.______ Reductions in projected property tax revenues
i.______ Increase in the historical level of residential development
j.______ Other (please specify):________________________________
k.______ Information not available
l.______ Not applicable -- no commercial/industrial growth control or growth management measures

23. JOBS/HOUSING BALANCE

Has your city enacted a policy or ordinance which specifies a desired or required ratio of the number of housing units per the number of jobs within a given area or within the entire city?

a.______ YES b.______ NO

If YES, what is that ratio or percentage:________________________

24. JOBS/HOUSING LINKAGE

Has your city enacted an ordinance to require commercial/industrial developers to pay in-lieu fees for housing development or to construct housing units as a condition of development approval?

a.______ YES b.______ NO

- -

IV. OTHER GROWTH CONTROL AND GROWTH MANAGEMENT MEASURES

25. URBAN LIMIT LINE/GREENBELT

Has your city established an urban limit line or greenbelt, other than the boundaries of your city, beyond which residential, commercial and/or industrial development is not currently permitted?

a.________ YES b.________ NO

If YES, adopted by: (1)______ initiative or (2)______ ordinance.
(3)______ year enacted.

26. OTHER MEASURES

Does your city have other existing or pending measures which fall under the definition of growth control or growth management which are not covered under the prior questions?

a.________ YES b.________ NO

Appendix A: Glickfeld/Levine Survey (continued)

If YES, please describe: (1)_____

If YES, adopted by: (2)_____ initiative or (3)_____ ordinance or (4)_____ pending and (5)_____ year enacted.

- -

V. MONITORING AND EVALUATION OF GROWTH CONTROL AND GROWTH MANAGEMENT MEASURES

27. MONITORING BENEFITS AND IMPACTS

Has your city established a program for monitoring or measuring the benefits and impacts of your growth control or growth management measures?

a._____ YES b._____ NO

28. EVALUATING BENEFITS AND IMPACTS

Have any studies been conducted by the city or any other public or private agency or group to analyze the benefits and impacts of your growth control or growth management measures?

a._____ YES b._____ NO c._____ Don't Know

If YES, please list the titles and authors of these studies below:

_____

_____

_____

- -

VI. GENERAL COMMENTS

29. Please use the space below to write any comments on growth control and growth management measures which were not included in the prior questions or any comments you may have on this survey.

_____

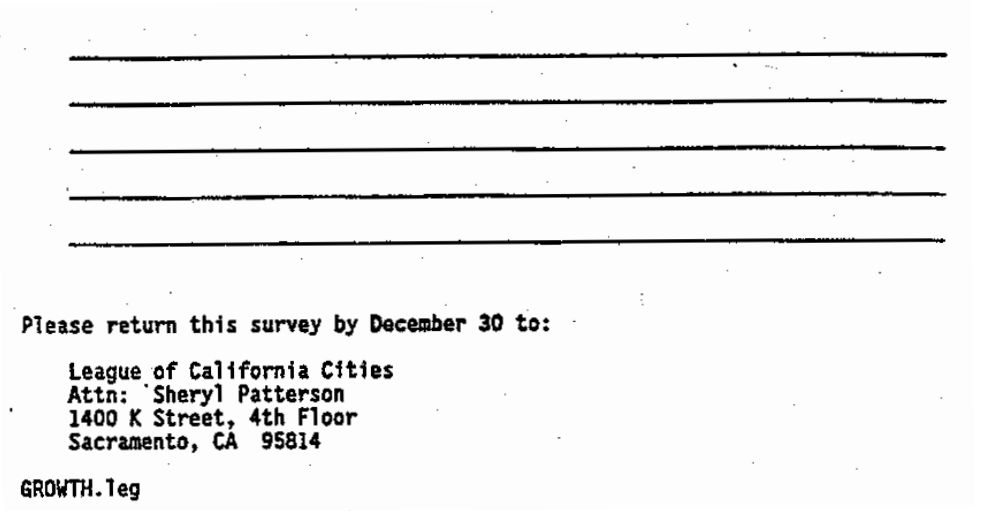
_____

_____

_____

_____

Appendix A: Glickfeld/Levine Survey (continued)



Please return this survey by December 30 to:

League of California Cities
Attn: Sheryl Patterson
1400 K Street, 4th Floor
Sacramento, CA 95814

GROWTH.leg

Appendix B: Wharton Survey Instrument

WHARTON URBAN DECENTRALIZATION PROJECT

(with the cooperation of the International City Managers Association)

* * * * * * * * *

DEVELOPMENT REGULATION SURVEY QUESTIONNAIRE

I. JURISDICTION

Name of Jurisdiction _____ Zip Code _____

1. Type of Jurisdiction: [ ] City
   [ ] County
   [ ] Township
   [ ] Town, Village, or Borough
   [ ] Other _____

2. Size of Jurisdiction: _____ Square miles

3. Population

   a) Current Population Estimate _____

   b) Annual Population Growth Rate

   Past 5 years _____ % per year

   Projected next 5 years _____ % per year

II. DEVELOPMENT POLICIES

The following questions concern public policies and actions that affect the supply of land for single-family detached housing. Please give us the benefit of your opinion.

4. What is the main building code utilized by your community?

Building Officials and Code Administrators (BOCA)	[ ]
Southern Building Code (SBCCI)	[ ]
Uniform Building Code (UBC/ICBO)	[ ]
Council of American Building Officials (CABO)	[ ]
Other	[ ]

Appendix B: Wharton Survey Instrument (continued)

5. Please rate the importance of the following factors, on a scale of 1 to 5, to the development process in your community. (1 = not at all important to 5 = very important)

	Not Important 1	2	3	4	Very Important 5	Not Sure
Population Growth	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Population density	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Adequate infrastructure	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Land costs	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Regulation	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Development standards	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Comprehensive planning	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Tax rates	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Quality of life	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Other specify	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

6. On a scale of 1 to 5, please rate the effectiveness of each of the following growth management techniques in controlling growth in your community. (1 = not effective to 5 = very effective).

	Not Important 1	2	3	4	Very Important 5	Not Sure
Adequate facilities	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Ordinances	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Building permits	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Population limits	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Exactions/impact fees	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Urban service boundary	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Farm protection	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Zoning ordinance	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Other specify	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

7. How did the time to obtain a routine single-family project approval (zoning and subdivision) change during the period from 1983 to 1988?

Shortened considerably	Shortened somewhat	No change	Increased somewhat	Increased considerably	No opinion
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Appendix B: Wharton Survey Instrument (continued)

8. What is the typical amount of time between application for rezoning and issuance of a building permit for the development of:

	Less than fifty single-family units	Fifty or more single-family units	Office building of under 100,000 square ft.
Less than 3 mons.	[ ]	[ ]	[ ]
3 to 6 months	[ ]	[ ]	[ ]
7 to 12 months	[ ]	[ ]	[ ]
13 to 24 months	[ ]	[ ]	[ ]
More than 24 months	[ ]	[ ]	[ ]

9. What is the typical amount of time between application for subdivision approval and the issuance of a building permit (assume proper zoning already in place) for the development of:

	Less than fifty single-family units	Fifty or more single-family units	Office building of under 100,000 square ft.
Less than 3 mons.	[ ]	[ ]	[ ]
3 to 6 months	[ ]	[ ]	[ ]
7 to 12 months	[ ]	[ ]	[ ]
13 to 24 months	[ ]	[ ]	[ ]
More than 24 months	[ ]	[ ]	[ ]

10. How does the acreage of land zoned for the following land uses compare to demand?

	Far more than demanded	More than demanded	About right	Less than demanded	Far less than demanded	No opinion/ not sure
Single Family	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Multi/Family	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Commercial	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Industrial	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

11. How does the current availability of land zoned for the following single-family residential lot sizes compare to demand?

	Far more than demanded	More than demanded	About right	Less than demanded	Far less than demanded	No opinion/ not sure
Less than 4,000 sq. ft.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
4,000 - 8,000 sq.ft.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
8,000 - 10,000 sq. ft.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
10,000 - 20,000 sq. ft.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Over 20,000 sq. ft.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Appendix B: Wharton Survey Instrument (continued)

12. How many single-family lots have been approved for development (with full services) for each of the following lot sizes during the past 12 months? If zero, please indicate "0".

	Number of Lots
Less than 4,000 sq. ft.	_____
4,000 - 8,000 sq. ft.	_____
8,000 - 10,000 sq. ft.	_____
10,000 - 20,000 sq. ft.	_____
Over 20,000 sq.ft.	_____

13. How many acres of land have been approved for development (with full services) for each of the following land uses during the last 12 months? If zero, please indicate "0".

	Acreage
Multi-family	_____
Office	_____
Retail	_____
Industrial	_____

14. Approximately what percentage of applications for zoning changes were approved in your community during the past 12 months?

[ ] 100-90% [ ] 89-60% [ ] 59-30% [ ] 29-10% [ ] 10-0%

15. How has the provision of roads and sewers kept pace with growth needs?

Much more than needed	Slightly more than needed	About right	Less than needed	Far less than needed	No opinion/ not sure
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Appendix B: Wharton Survey Instrument (continued)

16. For a typical 2,000 - 3,000 sq. ft. single family home (for example, with 3 bedrooms and 2 baths), please indicate which fees/exactions are imposed in your area and associated characteristics:

	Amount (dollar or set-aside acreage)	Unit of impact (e.g. per sq. ft.)	Assessed at the time of: Zoning	Assessed at the time of: Sub-division	Assessed at the time of: Permit	Paid at the time of: Zoning	Paid at the time of: Sub-division	Paid at the time of: Permit
Schools	___	_____	___	___	___	___	___	___
Parks	___	_____	___	___	___	___	___	___
Sewer	___	_____	___	___	___	___	___	___
Fire Houses	___	_____	___	___	___	___	___	___
Libraries	___	_____	___	___	___	___	___	___
Community Centers	___	_____	___	___	___	___	___	___
Others	___	_____	___	___	___	___	___	___

We do not use fees/exactions _____

17. Which of the following techniques does your community use to regulate the conversion of land from agricultural/open space to residential, commercial or industrial use?

[ ] Agricultural Land Conversion Tax
[ ] Transfer of Development Rights
[ ] Land Banking
[ ] Real Estate Transfer Tax
[ ] Urban Development Boundaries
[ ] Water/Sewer provision Staging Plan
[ ] Historic Preservation Requirements
[ ] Other

18. In your community, how prevalent are the following modes of introducing growth management policies?

	Very prevalent	Somewhat prevalent	Not prevalent	Not sure/do not know
Citizen referendum	[ ]	[ ]	[ ]	[ ]
Legislative action by the municipality	[ ]	[ ]	[ ]	[ ]
Legislative action by the county	[ ]	[ ]	[ ]	[ ]
Legislative action by the state	[ ]	[ ]	[ ]	[ ]
Administrative action by public authorities	[ ]	[ ]	[ ]	[ ]

Appendix B: Wharton Survey Instrument (continued)

19. How much has the cost of lot development, including subdivision, increased from 1983-1988?

[ ] None [ ]1-9% [ ] 10-19% [ ] 20-29%
[ ] 30-39% [ ] 40-49% [ ] 50% or more

20. How would you describe your jurisdiction?

[ ] High growth area
[ ] Medium growth area
[ ] Slow growth area
[ ] No growth area

21. In your opinion, how do living conditions in this community compare to five years ago?

[ ] Better [ ] Worse
[ ] About the same [ ] Not sure/do not know

22. In your opinion, who should pay for roads, sewers, and schools when a new residential development is built?

[ ] Developers [ ] All residents in the city
[ ] Users [ ] New residents
[ ] Share between developers and new residents

23. Name_____

24. Title_____

25. Organization_____

26. Status: [1] Public
[2] Private
[3] Non Profit

27. Address_____

28. Telephone_____

29. How long have you worked or lived in the community?
_____ years.

30. Check this box if you would like to receive a copy of the results of this survey. [ ]

THANK YOU

November 1989

Appendix B: Wharton Survey Instrument (continued)

WHARTON URBAN DECENTRALIZATION PROJECT

SURVEY OF COUNTY GOVERNMENTS

I. GENERAL INFORMATION

1. Name of County: _____
2. State: _____
3. Size of County: _____ square miles
4. Size of population: _____
5. Number of municipal governments (cities, towns, boroughs, villages, or townships) in county: _____

   Number of school districts in county: _____

   Number of special districts in county: _____

   Number of cities in county with population > 100,000 : _____
6. How would you describe your county? Please check one.

   [ ] High growth area [ ] Medium growth area
   [ ] Slow growth area [ ] No growth area

II. FINANCIAL POLICY AND ADMINISTRATION STRUCTURE

7. TAXATION

   (a) Which governments have the authority to impose a property tax in the county? Please check each that do.

   [ ] County [ ] Municipalities [ ] Special Districts [ ] School Districts

   (b) What is the **effective** county tax rate for each of following types of property? (effective rate = statutory rate x average assessment ratio)

Residential	_____ %	answers should be ≤ 10%
Commercial	_____ %	answers should be ≤ 10%
Industrial	_____ %	answers should be ≤ 10%

Appendix B: Wharton Survey Instrument (continued)

8. IMPACT FEES AND EXACTIONS (set-aside requirements)

(a) Which of the following levels of government impose impact fees or exactions on new residential developments, for each type of service indicated? Please check each government unit that assesses an impact fee.

SCHOOLS:	[ ] County	[ ] Municipalities	[ ] School Districts
PARKS:	[ ] County	[ ] Municipalities	[ ] Special Districts
LIBRARIES/ COMMUNITY CENTERS:	[ ] County	[ ] Municipalities	[ ] Special Districts
PUBLIC SAFETY:	[ ] County	[ ] Municipalities	[ ] Special Districts
WATER:	[ ] County	[ ] Municipalities	[ ] Special Districts
SEWER:	[ ] County	[ ] Municipalities	[ ] Special Districts
ROADS:	[ ] County	[ ] Municipalities	[ ] Special Districts
OTHERS:	[ ] County	[ ] Municipalities	[ ] Special Districts

(b) Please answer this question for only those services financed by impact fees/exactions charged by the county. If there are no county impact fees, then please go on to question 9. Do not include permit fees.

Consider a new development consisting of 100 single family homes (approximately 3 bedrooms, 2 baths, 2500 square feet, half acre lot, 1 car garage). What impact fees or exactions are typically applied? Please fill in 0 if no fees or set asides are required. If dollar fees are substitutable for acreage set-asides, list only the $ amount.

	$ AMOUNT PER UNIT	ACREAGE SET ASIDE PER UNIT
Schools:	_____	_____
Parks:	_____	_____
Libraries/ Community Centers:	_____	_____
Public Safety:	_____	_____
Water:	_____	_____
Sewer:	_____	_____
Roads:	_____	_____
Others:	_____	_____

Appendix B: Wharton Survey Instrument (continued)

9. Debt Structure

(a) General obligation bonds are issued by:

[ ] County [ ] Municipalities
[ ] Special Districts [ ] School Districts

(b) Revenue bonds (pledged against user charges) are issued by:

[ ] County [ ] Municipalities
[ ] Special Districts [ ] School Districts

10. User Fees

(a) Which levels of government impose user charges? Check all relevant levels.

[ ] County [ ] Municipalities
[ ] Special Districts [ ] School Districts

(b) For those user charges utilized by the county, list the item and unit of impact. (Ex. item: Toll roads charge = $.10 per mile)

Item 1: _____ charge = _____
Item 2: _____ charge = _____
Item 3: _____ charge = _____
Item 4: _____ charge = _____

11. To what extent is the financial and production organization of your county influenced by the following factors? On a scale of 1 to 5 (5 = highest grade), please check a number for each factor.

	[1]	[2]	[3]	[4]	[5]
Desire to approximate most cost effective structure	___	___	___	___	___
Desire to mitigate service inequities within county	___	___	___	___	___
Desire to have maximal autonomy by local communities	___	___	___	___	___
Adherence to historical custom	___	___	___	___	___

12. In choosing the county's mix of taxes, fees, debt, user charges and the like, do you consider the relation between your choice and the choices of nearby counties?

[ ] Yes [ ] No

Please comment:

Appendix B: Wharton Survey Instrument (continued)

13. In your opinion, do municipalities within your county and across other counties "compete" for jobs and high income residents by their choice of financing and service provision:

[ ] Yes [ ] No

We would appreciate any elaboration you might make on this point.

14. To what extent do the following characteristics of municipalities influence whether or not they arrange for public services through the county, produce the service in conjunction with other municipalities, or produce the services themselves? (5=highest grade)

	[1]	[2]	[3]	[4]	[5]
Population size	___	___	___	___	___
Average household income	___	___	___	___	___
Access to grants-in-aid	___	___	___	___	___
Desire for autonomy	___	___	___	___	___
Ability to privatize	___	___	___	___	___

II. LAND USE REGULATIONS AND ADMINISTRATION

15. ZONING

(a) Please check the statement below which best describes your county.

[ ] Only the county exercises zoning authority.
[ ] Only municipalities exercise zoning.
[ ] The county zones unincorporated areas only and municipalities exercise separate zoning authority.
[ ] The county zones for some municipalities while other municipalities decide their own zoning.

(b) If your county exercises zoning authority, please check each type of zoning used.

[ ] density restrictions [ ] minimum lot size requirements [ ] allowable use zoning

Appendix B: Wharton Survey Instrument (continued)

16. BUILDING PERMITS

(a) What statement below best describes your county? Please check one.

[ ] Only the county issues building permits.
[ ] Only municipalities issue building permits.
[ ] The county and some (or all) municipalities separately issue building permits.

(b) Please rate the degree to which the following factors influence whether a residential, commercial, or industrial project is awarded a county permit. (1=not important, 5=very important). Please check one number for each.

	[1]	[2]	[3]	[4]	[5]
Quality of building standards	___	___	___	___	___
Traffic impact	___	___	___	___	___
Environmental impact	___	___	___	___	___
Population impact	___	___	___	___	___
Preservation of residential character	___	___	___	___	___

17. LAND CONVERSION

Which of the following techniques does your county use to regulate the conversion of land from agriculture or open space to residential, industrial, or commercial use? Please check all techniques used.

[ ] Agriculture Land Conversion Tax
[ ] Transfer of Development Rights
[ ] Land Banking
[ ] Real Estate Transfer Tax
[ ] Urban Development Boundaries
[ ] Water/Sewer Provision Staging Plan
[ ] Historic Preservation Requirements
[ ] Others _____(Please specify)

IV. ADDRESS INFORMATION

Name: _____

Title: _____

Organization: _____

Street/box: _____

City: _____ State: _____ Zip: _____

Telephone: _____

THANK YOU !

Appendix C: Census Building Permit Survey Instruments

DUE DATE:

OMB No. 0607-0094: Approval Expires 02/29/2004

FORM **C-404** (5-24-2002)

REPORT OF PRIVATELY-OWNED RESIDENTIAL BUILDING OR ZONING PERMITS ISSUED

U.S. DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. CENSUS BUREAU

Please read instructions on the back of this form. For further assistance, call **1–800–845–8244** or **email us at mcd@census.gov**

Please mail OR fax this form to:

U.S. Census Bureau
1201 East 10th Street
Jeffersonville, IN 47132–0001
Fax: 1–800–438–8040

1. PERIOD IN WHICH PERMITS WERE ISSUED –

2. GEOGRAPHIC COVERAGE

If your building permit system had a coverage change, please mark (X) in appropriate box, provide an explanation in Section 6, then continue completing the form in Section 3.

051 ☐ Permits no longer required
052 ☐ Permit office has merged with another permit jurisdiction
053 ☐ Permit office has split into two or more jurisdictions
054 ☐ Permit office is now responsible for additional land outside of its original boundaries

SAMPLE

(Please correct any errors in name, address, and ZIP Code)

3. NEW RESIDENTIAL BUILDINGS — 100

a. If no new residential permits were issued during this period, mark an (X) in the box and proceed to Section 4 → ☐

Type of structure (1)	Item No. (2)	Number of Buildings (3)	Number of Housing units (4)	Valuation of construction *(Omit cents)* (5)
b. Single-family houses, attached and detached *[Exclude manufactured (mobile) homes.]*	101			
c. Two-unit buildings	103			
d. Three- and four-unit buildings	104			
e. Five-or-more unit buildings	105			
f. TOTAL – *Sum of 101–105*	109			

4. ADDITIONS, ALTERATIONS AND RENOVATIONS TO RESIDENTIAL STRUCTURES	Item No. (1)	Number of permits (2)	Valuation of construction *(Omit cents)* (3)
	434		

5. INDIVIDUAL RESIDENTIAL PERMITS AUTHORIZING CONSTRUCTION VALUED AT $500,000 OR MORE
(If more space is needed, please attach a separate sheet.)

Description (1)	Name and address of owner or builder (2)	Buildings (3)	Housing units (4)	Valuation of construction (5)
a. Kind of building 110 Site address 111				
b. Kind of building 120 Site address 121				

6. COMMENTS *(Continue on a separate sheet)*
600

7. PERSON TO CONTACT REGARDING THIS REPORT

a. Name 700

b. Telephone 710 — Area code | Number

c. Fax 720 — Area code | Number

d. E-mail address 730

e. Internet web address 740

See instructions on reverse side.

Appendix C: Census Building Permit Survey Instruments (continued)

INSTRUCTIONS FOR COMPLETING FORM C-404, "REPORT OF PRIVATELY-OWNED RESIDENTIAL BUILDING OR ZONING PERMITS ISSUED"

Public reporting burden for this collection of information is estimated to vary from 2 to 30 minutes per response. The average is 10 minutes per response for those that report monthly and 25 minutes for those that report annually. This includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to: Paperwork Project 0607-0094, U.S. Census Bureau, 4700 Silver Hill Road, Stop 1500, Washington, DC 20233-1500. You may e-mail comments to paperwork @census.gov; use "Paperwork Project 0607-0094" as the subject. This agency may not collect this information, and you are not required to complete this form, unless it displays a current valid Office of Management and Budget control number.

GENERAL INSTRUCTIONS FOR EACH SECTION

1. **PERIOD PERMITS WERE ISSUED** – Include all privately-owned residential permits which were authorized during the **month** or **year** shown.

2. **GEOGRAPHIC COVERAGE**

051 **Discontinue** – A building permit is no longer a requirement in your geographic coverage area.

052 **Merger** – Permit office has stopped issuing permits because it has merged with another permit-issuing jurisdiction. That new office has taken over the responsibility of issuing building permits for your office.

053 **Split** – Your permit office no longer covers a particular jurisdiction because that area now issues its own building permits.

054 **Annexed land area** – Permit office is now responsible for additional land outside of its original boundaries.

3. **NEW RESIDENTIAL BUILDINGS** – Summarize information for number of buildings, number of housing units, and valuation of construction as shown on the building or zoning permit. Enter the valuation as shown on the permit. If no valuation is listed, enter your best estimated value.

Item 101 – Single-family houses, attached and detached – Include all new privately-owned attached and detached single-family houses. Include attached single-family houses known commonly as townhouses or row houses where (1) each unit is separated from adjoining units by a wall that extends from ground to roof, (2) no unit is above or below another unit, and (3) each unit has separate heating and separate utility meters.

Item 103 – Two-unit buildings – Include all new privately-owned residential buildings that only contain 2 housing units, and do not meet the definition of attached single-family as shown under Item 101. All units must be stacked or share common utilities.

Item 104 – Three and four-unit buildings – Include all new privately-owned residential buildings that only contain 3 or 4 housing units, and do not meet the definition of attached single-family as shown under Item 101. All units must be stacked or share common utilities.

Item 105 – Five or more unit buildings – Include all new privately-owned residential buildings that only contain 5 or more housing units, and do not meet the definition of attached single-family as shown under Item 101. All units must be stacked or share common utilities.

Item 109 – Total – Sum of the data reported in Items 101 through 105, (101+103+104+105) for housing units, and valuation of construction. **Do not** total buildings.

4. **ITEM 434 – ADDITIONS, ALTERATIONS, AND RENOVATIONS** – Summarize information for number of permits and valuation as shown on the building permit for all additions, alterations and renovations to residential properties. Enter the valuation as shown on the permit. If no valuation is listed, enter your best estimated value.

Also include residential permits for property outside residential structure, such as sheds, fences, decks and pools and replacements, such as reroofing, residing, and new windows.

Exclude repairs that only keep the property in ordinary working condition.

5. **INDIVIDUAL RESIDENTIAL PERMITS AUTHORIZING CONSTRUCTION VALUED AT $500,000 OR MORE** – Please enter data in this section for individual permits valued at $500,000 or more included in Sections 3 and 4 above. If more than two such permits were issued, attach a separate sheet.

6. **COMMENTS** – Enter any explanations from Section 2, miscellaneous notes or questions. Include any revisions to data entered on previous forms.

7. **CONTACT INFORMATION** – Please fill in any blank areas or make any corrections to information already entered in these fields. Enter the Internet web address for your permit office, if applicable.

INSTRUCTIONS FOR CLASSIFYING RESIDENTIAL BUILDINGS

RESIDENTIAL BUILDINGS

Residential buildings are buildings containing one or more housing units. **A housing unit is a house, an apartment, a group of rooms or a single room intended for occupancy as separate living quarters.** Separate living quarters are those in which the occupants live separately from any other individuals in the building and which have a direct access from the outside of the building or through a common hall.

PERMITS TO INCLUDE

- **privately-owned residential buildings**, which include all residential buildings owned by a private company or an individual during the period of construction
- housing for the elderly, such as assisted living facilities, that do not have 24-hour skilled nursing care
- "turnkey" housing, which is housing that will be sold to a local public housing authority when completed
- all housing built by nonprofit organizations
- buildings manufactured partially off-site and transported and assembled at the construction site, such as prefabricated, paneled, pre-cut, sectional and modular (these do not include "mobile-HUD inspected" homes)
- foundation and interior finishing permits only when issued separately and a valuation of construction is shown (Include data on the proper line item depending on the number of housing units in the intended superstructure. Enter zero for the buildings and units in Items 101–105. Enter number of permits issued for additions and alterations to residential buildings in Item 434.)
- additions and alterations to residential buildings and on property outside residential structures
- major replacements, such as roof, siding, doors, and windows

PERMITS TO EXCLUDE

- publicly-owned buildings
- **manufactured (mobile-HUD inspected) homes** including related foundations and pads
- group quarters, such as dormitories, jails, nursing homes, etc.
- hotels/motels
- landscaping
- nonresidential buildings, other than structures on residential property such as sheds and garages which are included in Item 434.
- demolitions
- moved or relocated buildings
- maintenance and repair, which are expenses to keep a property in ordinary working condition
- farm buildings, such as silos, barns, etc.

MISCELLANEOUS CLASSIFICATION INSTRUCTIONS

- Enter a building in only one category. If you cannot determine a category, please call our staff on 1–800–845–8244.
- If a building has mixed residential and nonresidential use, enter the housing units based on the residential portion of the building. Please estimate the valuation based on the residential portion of the building only.
- Classify all buildings that are being totally re-built on an existing foundation as new construction.
- Type of ownership (e.g. condominium, cooperative, timeshare, etc.) is **NOT** considered when classifying a building.

FORM C-404 (5-24-2002)

Appendix C: Census Building Permit Survey Instruments (continued)

OMB No. 0607-0110: Approval Expires 07/31/2003

FORM SOC-QI/SF-1 (7-31-2000)

U.S. DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. CENSUS BUREAU

SURVEY OF HOUSING STARTS, SALES, AND COMPLETIONS
(SINGLE-FAMILY BUILDINGS)

TO BE COMPLETED BY CENSUS FIELD REPRESENTATIVE

Address or location of building

Builder/Owner

FSU

Project name (if any)

Place code

Building permit number | Permit issued: Month Day Year | Block | Lot

Serving post office, State, ZIP Code

RO

TO BE COMPLETED BY RESPONDENT

START
Has excavation started for the footings or foundation of this house?
1 ☐ Yes 2 ☐ No – *Go to DETACH_ATTACH*

START_DATE Month Year
When was this house started?

EX_COMP Month Year
When do you expect to complete this house?

COMPLETED
Is this house completed or occupied?
1 ☐ Yes 2 ☐ No – *Go to DETACH_ATTACH*

COMP_DATE Month Year
When was this house completed or occupied?

DETACH_ATTACH
Is this house –
1 ☐ Detached? – *Go to MANUFAC*
2 ☐ Attached as part of a group of two or more row or townhouses?

IF_ATTACHED
Is each house separated by a ground-to-roof wall with a separate heating system and with individual meters for public utilities such as water and sewer, electricity, gas, and with no other units above or below?
1 ☐ Yes 2 ☐ No

MANUFAC
Is this house –
1 ☐ **Modular?**
Finished 3-dimensional sections of the complete dwelling, built in a factory, are transported to the site to be joined together on a permanent foundation.
2 ☐ **Panelized?**
Shipped from the factory as a package of wall panels, roof trusses, and other components that are assembled on site. May include all materials required to finish the house as a complete package.
3 ☐ **Precut?**
A package of lumber or timber (logs), precut to exact size, length, and quantity, to be assembled on site. Package may also include plumbing, wiring, and/or heating system elements.
4 ☐ **Site-built?**
Built on site. Can include SOME factory components such as roof and floor trusses, wall panels, door frames, etc.

FIN_SQFT Square feet
What is the square foot area of completely finished floor space, including space in basement and attic with finished walls, floors, and ceilings?

INT_EXT
Is the square footage based on interior or exterior dimensions?
1 ☐ Interior
2 ☐ Exterior

FOUNDATIONS
What type of foundation does this house have?
1 ☐ Full or partial basement – *Go to FIN_BSMT*
2 ☐ Crawl space
3 ☐ Slab
20 ☐ None of the above – *Specify* _____
Go to LOT_SIZE

FIN_BSMT
Is part or all of this basement finished?
1 ☐ Yes 2 ☐ No – *Go to LOT_SIZE*

BSMT_SQFT Square feet
What is the square foot area of the finished part of the basement?

LOT_SIZE
What is the size of the individual lot on which this house is being built?

BEDROOMS Number
How many bedrooms are in this house?

FULL_BATH Number
How many full bathrooms are in this house?

HALF_BATH Number
How many half bathrooms are in this house?

STORIES
How many stories, **NOT INCLUDING** the basement, are in this house?
1 ☐ One
2 ☐ Two (including 1 1/2 stories)
3 ☐ Three or more (including 2 1/2 stories)
4 ☐ Split-level

EX_WALL1
What exterior wall material covers **most** of this house?
1 ☐ Wood or wood products (including masonite or T111)
2 ☐ Brick or brick veneer
3 ☐ Aluminum siding (not covered with vinyl)
4 ☐ Concrete stucco (such as Shotcrete)
5 ☐ Vinyl siding (including vinyl-covered aluminum)
6 ☐ Concrete block (including cinder, cement or building blocks)
7 ☐ Stone, rock, or other stone materials
8 ☐ Fiber cement siding (such as Hardiplank and Hardiboard)
20 ☐ None of the above – *Specify* _____

EX_WALL2
Is there any secondary exterior wall material, not including trim, shutters and woodwork around openings?
1 ☐ Yes
2 ☐ No – *Go to PARKING*

EX_WALL3
What secondary type of wall material is used?
Mark ONE box only.
1 ☐ Wood or wood products (including masonite or T111)
2 ☐ Brick or brick veneer
3 ☐ Aluminum siding (not covered with vinyl)
4 ☐ Concrete stucco (such as Shotcrete)
5 ☐ Vinyl siding (including vinyl-covered aluminum)
6 ☐ Concrete block (including cinder, cement or building blocks)
7 ☐ Stone, rock, or other stone materials
8 ☐ Fiber cement siding (such as Hardiplank and Hardiboard)
20 ☐ None of the above – *Specify* _____

PARKING
What type of parking does this house have?
Mark ONE box only.
1 ☐ Garage for 1 car
2 ☐ Garage for 2 cars
3 ☐ Garage for 3 or more cars
4 ☐ Carport
5 ☐ Other off-street parking (including a driveway with no garage or carport)
6 ☐ None of the above

FIREPLACES Number
How many working fireplaces are in this house?

DECK
Does this house have any decks? (floored areas **without** a roof, not sitting directly on the ground, typically made of wood)
1 ☐ Yes
2 ☐ No

PLEASE CONTINUE ON REVERSE SIDE.

Appendix C: Census Building Permit Survey Instruments (continued)

PATIO
Does this house have any patios? – (floored areas with **or** without a roof, sitting **directly** on the ground. – *Do not include small concrete pads at entryways.*)
1 ☐ Yes
2 ☐ No

PORCH
Does this house have any porches? (floored areas **with** a roof, enclosed or open, not sitting directly on the ground. – *Do not include small covered entryways.*)
1 ☐ Yes
2 ☐ No

HEAT_SOURCE
What energy source will be used **most** for heating this house?
1 ☐ Electricity
2 ☐ Natural gas (from underground pipes)
3 ☐ Bottled gas (including propane or tank gas)
4 ☐ Oil (including heating oil or kerosene)
5 ☐ Wood (including pellets)
6 ☐ Solar
7 ☐ Coal
8 ☐ No heat
20 ☐ None of the above – *Specify*: _____

HEAT_SYSTEM
What heating system will be used **most** in this house?
1 ☐ Heat pump, air source (including reverse-cycle air conditioners)
2 ☐ Heat pump, ground source (including closed-loop geothermal systems)
3 ☐ Forced-air furnace **without** heat pump
4 ☐ Hot water or steam (including hydronic systems)
5 ☐ Electric baseboard (including heat strips, wall panels, radiant heat)
6 ☐ Fireplace with insert
7 ☐ Stove that burns coal or wood
8 ☐ Non-portable room heater that burns liquid fuel and is connected to a flue, vent, or chimney to remove smoke/fumes
9 ☐ Passive solar system that uses a "thermal storage wall," "sunspace," or "solar greenhouse"
20 ☐ None of the above – *Specify*: _____

AIR_COND
Does this house have central air-conditioning?
1 ☐ Yes
2 ☐ No

SALES_CATEGORY
Is this house being built –
1 ☐ for sale, or is it already sold? – *Go to CONDO*
2 ☐ for the owner by a single general contractor on the owner's land? – *Go to CONTRACT_PRICE*
3 ☐ on the owner's land entirely by the owner, or by the owner acting as general contractor? } *Go to FINANCING*
4 ☐ for rent? }

CONTRACT_PRICE
What is the contract price for this house?
$ _____ – *Go to FINANCING*

CONDO
Is this house part of a condominium project?
1 ☐ Yes
2 ☐ No

DEPOSIT
Was a deposit taken or a sales agreement signed for this house?
1 ☐ Yes
2 ☐ No – *Go to INTEND_PRICE*
3 ☐ This is a MODEL home – *Go to INTEND_PRICE*

DEPOSIT_DATE
When was the deposit taken or sales agreement signed?
Month ____ Year ____

SALES_PRICE
What is the sales price?
$ _____

CLOSING_COSTS
Does the sales price include or exclude closing costs?
1 ☐ Includes
2 ☐ Excludes

LOT_VALUE
What is the value of the individual lot (including improvements such as grading, paving, installation of utilities, etc.)?
$ _____ – *Go to FINANCING*

INTEND_PRICE
What will the sales price be?
$ _____ – *Leave FINANCING blank*

FINANCING
What type of financing was or will be arranged, or will the house be paid for entirely with cash?
1 ☐ Conventional
2 ☐ FHA
3 ☐ VA
4 ☐ Farmer's Home
5 ☐ Pay cash
6 ☐ Habitat for Humanity
7 ☐ Loan from an individual
8 ☐ State or local government mortgage-backed bonds
20 ☐ None of the above – *Specify*: _____

Your Census Representative

NOTES

PLEASE RETAIN THIS FORM FOR YOUR USE WHEN CONTACTED BY YOUR CENSUS REPRESENTATIVE.

FORM SOC-QI/SF.1 (7-21-2000)

FORM **SOC-QI/MF.1**
(7-18-2000)

U.S. DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. CENSUS BUREAU

SURVEY OF HOUSING STARTS AND COMPLETIONS
(Multiunit Buildings)

TO BE COMPLETED BY CENSUS FIELD REPRESENTATIVE

PSU
Place code
RO

Builder/Owner	Project name (if any)	Serving post office, State, ZIP Code

	1	2	3	4
Address and identification of building				
Building permit number				

TO BE COMPLETED BY RESPONDENT

	1	2	3	4
START Has excavation started for the footings or foundation of this building?	1 ☐ Yes 2 ☐ No – *Go to UNITS_A*	1 ☐ Yes 2 ☐ No – *Go to UNITS_A*	1 ☐ Yes 2 ☐ No – *Go to UNITS_A*	1 ☐ Yes 2 ☐ No – *Go to UNITS_A*
START_DATE When was this building started?	Month | Year	Month | Year	Month | Year	Month | Year
EX_COMP When do you expect at least half the units to be available for occupancy?	Month | Year	Month | Year	Month | Year	Month | Year
COMPLETED Are at least half of the units in this building available for occupancy?	1 ☐ Yes 2 ☐ No – *Go to UNITS_A*	1 ☐ Yes 2 ☐ No – *Go to UNITS_A*	1 ☐ Yes 2 ☐ No – *Go to UNITS_A*	1 ☐ Yes 2 ☐ No – *Go to UNITS_A*
COMP_DATE When were half of the units in this building available for occupancy?	Month | Year	Month | Year	Month | Year	Month | Year
UNITS_A How many housing units are in this building?	Units	Units	Units	Units
FLOORS_A How many floors are in this building, excluding the basement unless it will contain two or more units?				
ATTACHED_A *(For buildings with 3 floors or less)* Are any of the units attached side-by-side, with no other units above or below?	1 ☐ Yes – *Continue* 2 ☐ No – *Go to BEDROOMS_A*	1 ☐ Yes – *Continue* 2 ☐ No – *Go to BEDROOMS_A*	1 ☐ Yes – *Continue* 2 ☐ No – *Go to BEDROOMS_A*	1 ☐ Yes – *Continue* 2 ☐ No – *Go to BEDROOMS_A*
HOW_MANY How many?	Units	Units	Units	Units
IF_ATTACH_A Is each unit separated by a ground-to-roof wall with a separate heating system, and with individual meters for public utilities such as water/sewer, electricity, gas, etc.?	1 ☐ Yes 2 ☐ No	1 ☐ Yes 2 ☐ No	1 ☐ Yes 2 ☐ No	1 ☐ Yes 2 ☐ No
BEDROOMS_A How many units will have – no separate bedrooms (efficiency)?	Efficiency	Efficiency	Efficiency	Efficiency
one bedroom?	1 bedroom	1 bedroom	1 bedroom	1 bedroom
two bedrooms?	2 bedrooms	2 bedrooms	2 bedrooms	2 bedrooms
three bedrooms or more?	3+ bedrooms	3+ bedrooms	3+ bedrooms	3+ bedrooms
BATHS_A How many units will have – one bathroom?	1 bath	1 bath	1 bath	1 bath
one and a half bathrooms?	1 1/2 baths	1 1/2 baths	1 1/2 baths	1 1/2 baths
two bathrooms or more?	2+ baths	2+ baths	2+ baths	2+ baths

Appendix C: Census Building Permit Survey Instruments (continued)

one and a half bathrooms?	1 1/2 baths	1 1/2 baths	1 1/2 baths	1 1/2 baths
two bathrooms or more?	2+ baths	2+ baths	2+ baths	2+ baths
FIN_SQFT_A What is the total square foot area of all floors in this building, excluding unfinished basements, laundry or boiler rooms, garage space, etc.?	Square feet	Square feet	Square feet	Square feet
MANUFAC_A Is this building – **1–Modular?** Finished 3-dimensional sections of the complete dwelling, built in a factory, are transported to the site to be joined together on a permanent foundation. **2–Panelized?** Shipped from the factory as a package of wall panels, roof trusses, and other components that are assembled on site. May include all materials required to finish the house as a complete package. **3–Site-built?** Built on site. Can include SOME factory components such as roof and floor trusses, wall panels, door frames, etc.	1 ☐ Modular 2 ☐ Panelized 3 ☐ Site-built	1 ☐ Modular 2 ☐ Panelized 3 ☐ Site-built	1 ☐ Modular 2 ☐ Panelized 3 ☐ Site-built	1 ☐ Modular 2 ☐ Panelized 3 ☐ Site-built
AIR_COND_A Does this building have air-conditioning?	1 ☐ Yes 2 ☐ No	1 ☐ Yes 2 ☐ No	1 ☐ Yes 2 ☐ No	1 ☐ Yes 2 ☐ No
HEAT_SRC_A What principal energy source will be used for heating this building?	1 ☐ Electricity 2 ☐ Gas (including propane, natural, bottled, tank, or butane gas) 4 ☐ Oil (including heating oil or kerosene) 8 ☐ No heat provided 20 ☐ None of the above – *Specify* *Go to FPLACE_A*	1 ☐ Electricity 2 ☐ Gas (including propane, natural, bottled, tank, or butane gas) 4 ☐ Oil (including heating oil or kerosene) 8 ☐ No heat provided 20 ☐ None of the above – *Specify* *Go to FPLACE_A*	1 ☐ Electricity 2 ☐ Gas (including propane, natural, bottled, tank, or butane gas) 4 ☐ Oil (including heating oil or kerosene) 8 ☐ No heat provided 20 ☐ None of the above – *Specify* *Go to FPLACE_A*	1 ☐ Electricity 2 ☐ Gas (including propane, natural, bottled, tank, or butane gas) 4 ☐ Oil (including heating oil or kerosene) 8 ☐ No heat provided 20 ☐ None of the above – *Specify* *Go to FPLACE_A*
HEAT_PUMP_A Will this building have any heat pumps?	1 ☐ Yes 2 ☐ No	1 ☐ Yes 2 ☐ No	1 ☐ Yes 2 ☐ No	1 ☐ Yes 2 ☐ No
FPLACE_A How many units in this building have a built-in fireplace with a flue?	Units	Units	Units	Units
PARKING_A Are there parking spaces in or under the building?	1 ☐ Yes 2 ☐ No	1 ☐ Yes 2 ☐ No	1 ☐ Yes 2 ☐ No	1 ☐ Yes 2 ☐ No
OWNERSHIP_A Are the units in this building – 1–For rent? 2–For sale as condominiums or cooperatives? 3–For sale, not as condominiums or cooperatives?	1 ☐ For rent 2 ☐ For sale as condominiums or cooperatives 3 ☐ For sale, not as condominiums or cooperatives	1 ☐ For rent 2 ☐ For sale as condominiums or cooperatives 3 ☐ For sale, not as condominiums or cooperatives	1 ☐ For rent 2 ☐ For sale as condominiums or cooperatives 3 ☐ For sale, not as condominiums or cooperatives	1 ☐ For rent 2 ☐ For sale as condominiums or cooperatives 3 ☐ For sale, not as condominiums or cooperatives
OTHER_BLDGS Have other permits been taken out previously for residential buildings in this project? 1 ☐ Yes – Approximately when did this last occur? → Month | Year 2 ☐ No	NOTES		Your Census Representative	

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