The Political Allocation of Property Rights:
An Application to State Land Use Regulation

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In private markets with secure property rights, resources are continually reallocated through the process of market exchange. Land use, for example, constantly changes. Cropland is converted into residential subdivisions, wetlands are converted into retail establishment, and land once used for apartment dwellings may be converted into an office complex. The process is evolutionary, reflecting changes in the most highly valued use of real property. However, the process of land conversion, as well as new land use, may generate negative externalities, such as noxious fumes from a poultry-processing plant, excessive noise from an apartment complex and congestion from a strip mall.

Coase (1960) extends the application of market exchange to externalities by demonstrating that when transactions costs are sufficiently low and property rights are well-defined, enforced, and transferable, voluntary bargaining between the affected parties will lead to optimal resource use. The Coasian outcome may not result, however, if transactions costs are high (as may be the case when the number of parties to a transaction is large), affected parties engage in strategic bargaining, or information is asymmetrical (Polinsky, 1979).

Yet, the Coasian solution does apply to land use in the contemporary U.S. For example, Rinehart and Pompe (1998) show that market-driven, environmental decision-making by private developers protects coastal resources such as beaches. In addition, private parties have preserved land and prevented development by forming land trusts that hold over 17 million acres. According to Mulholland (2001), land trusts are becoming Athe instrument of

choice for those wishing to protect open space, farmland, watersheds, and other natural features of the landscape@ (p. 1). Governments too are increasingly active purchasers of land for preservation. For example, governments in New Jersey, Pennsylvania, and Texas are using tax revenues, bond issues, and fees for municipal services to raise money to purchase undeveloped land.[1]

Governmental regulation of land use, which has a long history and wide application in the U.S., is often used as an alternative to private negotiation or purchase (Dowling, 2000, p. 881). A host of laws and regulations limit land use in order to control negative externalities such as habitat loss, pollution, and shoreline erosion. Simply put, the sticks in the bundle of rights to private property can be determined by and altered through the political process.

In recent years, concern about Aurban sprawl@ has led to increasing regulation of land use. The Sierra Club defines sprawl as Alow-density development beyond the edge of service and employment, which separates where people live from where they shop, work, recreate, and educateCthus requiring cars to move between zones.@[2] The Brookings Institute defines sprawl Ain terms of land resources consumed to accommodate new urbanization. If land is being consumed at a faster rate than population growth, then a metropolitan area can be characterized as >sprawling=@ (Fulton, et al, 2001, p. 3).

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[1]See the Sierra Club=s 1998 Sprawl Report at www.sierraclub.org/ sprawl/report98.

[2]See the Sierra Club=s 1998 Sprawl Report at www.sierraclub.org/ sprawl/report98.

Whatever the definition, evidence of sprawl is compelling. The Brookings study of 281 metropolitan areas in the U.S. from 1982 to 1997 found that only 17 metropolitan areas became denser. Although U.S. population grew 17 percent over these years, urban land use expanded by 47 percent. Or, looked at in another way, Ametropolitan density fell from 5.00 persons per urbanized acre in 1982 to 4.22 persons per urbanized acre in 1997@ (Fulton, et al., p. 3).

The consequences of sprawl may include Aincreased traffic congestion, longer commutes, increased dependence on fossil fuels, crowded schools, worsening air and water pollution, lost open space and wetlands, increased flooding, destroyed wildlife habitat, higher taxes and dying city centers.@[3] Market motivated solutions such as those discussed above are possible. However, recently Asmart growth@ laws, which seek to protect open spaces, environmental amenities, and historical landmarks using policies such as minimum lot sizes, impact fees, and urban service boundaries, have become increasingly popular.

Evidence showing the popularity of legal and regulatory solutions is overwhelming. A study by the Brookings Institute tallied 553 growth-related state and local government ballot measures before voters in the November 2000 elections. The content of these measures varied, but included initiatives to preserve open space, develop infrastructure, manage growth, develop the local economy, and alter the authority of state and local governments to deal with growth issues. Of these 553 initiatives, 77.22 percent passed (Myers and Puentes, 2001).

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[3]See the Sierra Club=s 1998 Sprawl Report at www.sierraclub.org/ sprawl/report98.

In this paper we distinguish between market-based or Coasian means of solving externalities associated with land use and regulatory or political means. We attempt to determine whether market forces or regulatory powers are more likely to reallocate property rights (or prevent such a reallocation), when interested parties seek to influence land use. Believing that those wishing to reallocate property rights are concerned with efficiency, we hypothesize that the cost-minimizing solution will be chosen. That is, if transactions costs are low and property values relatively cheap, the market-based or Coasian solution will be chosen. On the other hand, if transactions costs are high and property values relatively expensive, the political solution will be chosen. We test this hypothesis by considering the prevalence of statewide regulations to contain urban sprawl.

In the following section, we present a model to predict the likelihood that political solutions will be used to control sprawl. In the third section we present empirical evidence supporting our hypothesis that political solutions are employed to control sprawl when they are relatively cheaper than market-based ones. We offer some final thoughts in the conclusion.

Land use allocation: market-based or political methods?

Clearly, rights to land development are controversial in the U.S. proponents of environmental preservation and smart growth have made significant progress by transferring land rights to the status of either public property or regulated private property. This progress have been so great that a counter movement to reinforce land rights was born in the 1990s (Yandle, 1995).

To model whether market or political forces will allocate property rights to land, we posit a simple and familiar framework. In Figure 1 we show the marginal benefits and costs of land development for a specific geographic area such as a state. In accordance with standard assumptions, the marginal cost of development (MCD) rises (e.g., from greater congestion, pollution) and the marginal benefit of development (MBD) falls (e.g., from increasingly lower value development projects) as more land is developed (MCU) rises (e.g., from a lack of economic gains from

development) and the marginal benefit of undeveloped land (MBU) falls (e.g., from increasingly lower valued environmental and rural amenities). MBD and MCU are the same function but moving in opposite directions; for example, MBD increases, MCU declines. Likewise for the pair MBU and MCD.

In a Coasian world with zero transactions costs and all property rights clearly defined, enforced, and transferable, the optimal amount of development would occur at L* where MCD=MBC (or MCU=MBU). This would indicate that negative

externalities were internalized. Nevertheless, attainment of the optimal quantity of land development may not satisfy all interested parties. Some citizens and interest groups

might prefer less development. Given the cost of land, V_0, which reflects the purchase price and transactions costs, they will settle for L*. But if land resources can be reallocated at a cost less than V_0 such as V_1, they will attempt a movement towards less development, i.e., to a point to the left of L*, such as L_1. Other groups favoring development may try to move to the right of L*.

The political process offers such an opportunity, if politicians have authority over resource allocation and are willing to use this authority for a political price (e.g., interest group support) that is less than V_0. The influence of interest groups on political outcomes is well known (e.g., Stigler, 1971; Peltzman, 1976). Becker (1983) extends the original theory to show that interests that are perceived to benefit the public are more likely to garner political support. Caplan (2001) provides evidence that public interest (actual or perceived), rather than strict self-interest, influences political outcomes by showing that ideology and education are the primary determinants of voter preferences on party affiliation and a wide array of social and economic issues.

Using this simple analytical framework and theories of how the political sector might be influenced, we can identify factors that make the political allocation of land rights more likely. Specifically, we hypothesize that state-level land use legislation is more likely to be implemented when:

(1) An interest group has an economic incentive to move to a point left of L*, such as L_1. The political solution is relatively attractive at L_1 because the price of land, reflecting the marginal benefit of development, is high relative to the marginal benefit of undeveloped land.

(2) An interest group has an ideological motive to move to a point to the left of L*, such as L_1.

(3) A factor increases the transaction cost of negotiating with private landowners. In terms of our model, higher transactions costs raise the cost of preserving undeveloped land as shown by an upward shift in the MCU curve.

(4) A factor raised the purchase price of land. Higher land values indicate a higher benefit from development and shift the MBD curve upward.

(5) A factor changes the price of political support. For example, if a factor lowers the price of influencing legislators below V_0, political outcomes become more likely.[4]

Thus, we expect that when the political allocation of land resources is relatively inexpensive, state-level regulations will be relatively extensive. Knapp (2000) provides support for this proposition, recognizing that Asmart growth must be understood as a political process, the outcome of which depends on the players involved and the relative power and prowess of those players@ (p. 331). Bolick (2000) is quite explicit about the role of and rationale for politics in land allocation, arguing that because private and government (through eminent domain) purchases of land are expensive relative to regulation, Athe coercive model, effectuated through urban growth boundaries and other regulations, is more politically palatable than massive tax increases@ (p. 863).

Empirical test and results

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[4]We note that greater access could also benefit the opponents of land use legislation.

To test our theory, we model the factors that determine the degree of state-level land use regulation across the U.S. We derive the dependent variable, which measures the extent of state-level land use regulation, from the Sierra Club=s 1999 Sprawl Report.[5] The Sierra Club rated states= land use planning by four criteria: whether or not a state has state-level land use legislation, the state=s role in local land use planning, the state=s use of growth-curbing tools (such as urban growth boundaries, public participation requirements, impact fees, and regional coordination), and the state=s utilization of field experts= input in land use planning. Table 1 shows state ratings on each of these criteria.

Our empirical model may be stated succinctly by the following equation:

$$RATING = \alpha_0 + \alpha_1 IG + \alpha_2 X + \varepsilon,$$

when RATING is the Sierra Club rating as described above, IG is a vector of interest group variables that favor land use legislation and regulation, and X is a vector of other exogenous variables that affect the position of the MBD or MCD curves.

We consider three interest groups that might favor land use regulations: homeowners, mayors of large cities, and environmentalists. Homeowners may find land use regulations desirable because they provide zoning that raises property values, for example, by limiting negative externalities. If land use regulations do reduce externalities, such as pollution and traffic congestion, established homeowners might want to limit the opportunities of others to Asprawl@ into their suburbs (Bolick, 2000, p. 863). Moreover, less development means rising house and lot values for exiting owners. Mayors and other big-city politicians

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[5]See the Sierra Club=s 1999 Sprawl Report at www.sierraclub.org/sprawl/report99.

Table 1. 1999 Sierra Club Sprawl Report

Key
1 - Very Effective
2 - Moderately Effective

3 - Not Effective

are also likely to favor regulations that curb sprawl since migrations from inner cities to suburbs erode cities= tax bases and support for public works projects. Finally, environmental interest groups are a driving force behind the smart growth movement, though their motives may be more ideological than economic.[6] To account for the influence of these interest groups, we include in our empirical estimates the share of each state=s population that owns a house (HOME), the weighted average of the percent change in population of all cities in a state with a population of more than 100,000 from 1990 to 1996 (CITYPOP), and as a proxy for environmentalists= influence in a state, members per 1,000 residents of three conservation organizationsCSierra Club, Greenpeace, and National Wildlife Federation (CONMEMB).

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[6]Anderson (ed.) (2000) provides numerous examples of environmentalists= influence on legislation and regulation.

A variety of other variables affect the position of a state=s MBD or MCD curves. We hypothesize that a large share of undeveloped land increases the likelihood of land use regulation because it raises the total cost of purchasing land, whether with private or public funds.[7] Of particular importance, the transactions costs of private purchases rise with the number of landowners, which should be positively correlated with the amount of undeveloped land. We hypothesize too, that rapid recent development imparts a sense of urgency to protect remaining undeveloped land, thereby increasing the likelihood of land use regulation. To account for these factors, we include the share of state land area that is rural (RURAL)[8] and the percent change in developed land from 1982 to 1997 (CHGDEVEL).

Variables that should raise the MBD curve are coastal land and population density. With over 50 percent of the U.S. population living in coastal areas,[9] the presence of coastal regions raises the cost of land purchases, making regulation of land use relatively cheap. Population density should increase development pressures and raise land values, thereby also lowering the relative cost of land use regulations. The effect of federally owned land on the relative cost of land use regulation is ambiguous. If federally owned land is a substitute for other undeveloped land, the pressure for land use regulations may diminish. Alternatively, because the federally owned land acts as a barrier to development legislation is less necessary. On the other hand, a large share of federal land may increase development pressures on remaining state lands and thus make

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[7]Formally, the total cost of rural or undeveloped land is the area under the MBD curve from a given share of existing developed land to the point where the MBD curve intersects the right-hand-side vertical axis.

[8]Rural land is defined as the sum of non-federal crop land, pasture land, rangeland, and forest land, and other undeveloped land.

[9]See U.S. Census Bureau, Statistical Abstract of the United States, 2000, table 30.

legislation more likely. To account for these factors, we include a state=s miles of shoreline, scaled by the state=s land area (SHORE),[10] a state=s population per square mile (DENSITY), and the share of state land area owned by the federal government (FEDLAND).

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[10]Shoreline is formally defined as the Aouter coast, offshore islands, sounds, bays, rivers, and creeks ... to the head of a tidewater or to a point where tidal waters narrow to a width of 100 feet.@ See the *World Almanac and Book of Facts*, 1992, p. 385.

Finally, access to state legislators lowers the cost of land use legislation and regulation, for environmentalists as well as developers. To measure access, we include each states=s ratio of legislators per registered voter (LEGISLATOR).

We report two estimates of the Sierra Club land use rating. The first estimate is a logit regression in which states with a summed rating less than 11 receive a value of one, and states with a summed rating of 11 or greater receive a value of 0. Thus a value of one signifies a state that is active in land use legislation. This division of the sample is somewhat arbitrary, but since 31 of the states have ratings of 11 or 12, this break seems reasonable. In the second estimate, we use the summed value of all the ratings and estimate with OLS.

Table 2 shows the results of the logit estimates. In equation (1), all independent variables are included. The results support the expectation that increased development creates a sense of urgency that makes protection of existing undeveloped land more desirable. In addition, environmentalist influence, as measured by the CONMEMB ratings, is significant, indicating environmentalists have an impact on land use legislation and regulation.[11] Shoreline mileage scaled by land area is also significant, a finding consistent with the model=s prediction that higher land values in coastal states makes land use regulation more likely. All other variables are insignificant, although RURAL, DENSITY and LEGISLATOR have the expected sign. The coefficient on FEDLAND is insignificant, but positive, suggesting that federally owned land may increase developmental pressure on private land. The model predicts correctly 82 percent of the states. In alternative specifications with various combinations of

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[11]We also tested a variable, the average ratings by the U.S. Chamber of Commerce of a state=s senators (USCOC), to capture the influence of groups that might prefer more development. Because USCOC was negatively correlated with CONMEMB, we did not include both variables in the same equation. In addition, because USCOC was insignificant, we do not report estimates using USCOC.

insignificant variables omitted, the results are consistent, with CHGDEVEL, CONMEMB, and SHORE always significant. In equation (5) RURAL is also

Table 2. Regression Results

Dependent Variable: Sierra Club Rating: Value = 1 if rating less than 11, Value = 0 if rating 11 or higher

Independent Variable	Logit Estimate (1) Coefficient/ (t - statistic)	Logit Estimate (2) Coefficient/ (t - statistic)	Logit Estimate (3) Coefficient/ (t - statistic)	Logit Estimate (4) Coefficient/ t - statistic)	Logit Estimate (5) Coefficient/ (t - statistic)
CONSTANT	-14.539	-19.983	-18.183	-21.592	-22.328
	(-1.050)	(-2.001)*	(-1.842)*	(-2.384)*	(-2.476)*
CHGDEVEL	0.126	0.117	0.113	0.116	0.117
	(2.430)*	(2.821)*	(2.688)*	(2.667)*	(2.797)*
	0.082	0.114	0.091	0.127	0.135
RURAL	(0.846)	(1.306)	(0.998)	(1.595)	(1.736)*
SHORE	0.186	0.197	0.205	0.194	0.204
	(1.764)*	(2.330)*	(2.424)*	(2.252)*	(2.448)*
	0.418	0.475	0.453	0.507	0.508
	(2.082)*	(2.483)*	(2.477)*	(2.670)*	(2.738)*
	0.013	0.015			
	(.214)	(.482)			
	0.030		0.022		
	(0.802)		(.905)		
	1.550			1.310	
	(.275)			(.253)	
	-0.043				
	(-0.399)				
	-0.061				
	(-0.534)				
x^2	32.2	31.0	31.6	31.1	30.7
Percent Right	82	82	82	82	82

*Significant at the 10 percent level or better for a two-tail test

significant, a finding suggesting that a large share of undeveloped land and high transactions costs associated with private negotiations make legislation and regulation more attractive.

In the OLS estimates reported in Table 3, the expected signs are reversed since lower summed ratings indicate more effective and use regulation. Equation (1), which includes all independent variables, reinforces the findings reported from the logit regression, with rapid recent development, environmentalist influence, and shoreline mileage significantly increasing land use regulation. An additional finding consistent with the model is that a large share of rural land significantly increases state regulation. Population density, the share of land owned by the federal government, the legislator to voter ratio, the share of population owning its own home, and population growth in large cities have no significant effect on land use regulation. In alternative specifications, we consistently find that the CHGDEVEL, RURAL, SHORE, and CONMEMB variables are significant.[12]

This empirical analysis conforms to many of our expectations. A rapid recent increase in development along with a large share of land that interest groups might deem worthy of protection raise the likelihood and effectiveness of political protection. That is, states with a large share of rural land that is being rapidly developed are most likely to adopt land use regulations, and these regulations are most likely to be rated as effective by the Sierra Club. These findings correspond to our prediction that high land values and transactions costs make the political allocation of land resources relatively cheap and appealing. Land along the coast, which is highly valuable and ecologically sensitive, also makes political solutions to land use conflicts more likely.

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[12]We also estimated the model using the state ranking as the dependent variables with results that are comparable to those reported in Tables 1 and 2.

The single interest group variable that is consistently significant is our proxy for environmentalists= strength and influence in a state.

Table 3. Regression Results

Dependent Variable: Sierra Club Rating

Independent Variable	OLS Estimate (1) Coefficient/ (t - statistic)	OLS Estimate (2) Coefficient/ (t - statistic)	OLS Estimate (3) Coefficient/ (t - statistic)	OLS Estimate (4) Coefficient/ (t - statistic)	OLS Estimate (5) Coefficient/ (t - statistic)
CONSTANT	25.506 (4.728)*	24.327 (5.706)*	25.249 (5.910)*	23.468 (6.228)*	23.520 (6.221)*
CHGDEVEL	-0.048 (-2.627)*	-0.037 (-2.559)*	-0.042 (-2.831)*	-0.037 (-2.515)*	-0.038 (-2.691)*
RURAL	-0.122 (-2.732)*	-0.110 (-2.636)*	-0.120 (-2.824)*	-0.103 (-2.705)*	-0.103 (-2.741)*
SHORE	-0.128 (-3.163)*	-0.133 (-3.561)*	-0.132 (-3.613)*	-0.130 (-3.516)*	-0.130 (-3.577)*
CONMEMB	-0.240 (-3.504)*	-0.251 (-4.053)*	-0.261 (-4.173)*	-0.243 (-4.045)*	-0.244 (-4.112)*
DENSITY	-0.028 (-.929)	0.007 (0.424)			
FEDLAND	0.007 (0.412)		0.011 (0.878)		
LEGISLATOR	-.003 (-.442)			-.001 (-.168)	
HOME	-0.008 (-0.168)				
CITYPOP	0.064 (1.170)				
F-statistic	4.13	7.30	7.52	7.25	9.26
Adj. R²	0.370	0.396	0.404	0.394	0.408

*Significant at the 10 percent level or better for a two-tail test.

This finding is consistent with Caplan=s findings that ideology drives many political outcomes and the work reported in Anderson which shows that a powerful interest group environmentalists can be.

The insignificance of the share of state land owned by the federal government may indicate that federal land simultaneously serves as a substitute for undeveloped land and increases pressure on existing state lands for development. Finally, we find no significant evidence that greater legislator access, population density, the share of population owning its own home, or the population growth of large cities increase the likelihood of state level land use legislation and regulation.

Conclusion

In a dynamic world with secure property rights, resources will continually be reallocated among alternative cases. As shown by Coase, when private parties are free to exchange resources in unregulated markets, resources will flow to their most highly valued use, so long as transactions costs are sufficiently low and property rights to those resources are defined, enforced, and transferable. The power of the state to allocate resources, however, introduces opportunities for influential interest groups to reallocate resources in ways not in accordance with private, free market outcomes.

We hypothesized that interest groups seek to employ the state=s regulatory power to reallocate land, or prevent private transactions that would reallocate land, when private market outcomes are considered undesirable and the cost of reallocation through the political sector is relatively low. To test our hypothesis, we employed the Sierra Club=s ratings of state land-use regulations as a measure of the extent to which a state=s land is allocated through the political sector. Our findings support our hypothesis, by showing that environmentalists= influence, rapid recent

development, expensive land values, and high transactions costs increase the stringency of state land use regulation. Policy makers should realize that although urban sprawl may generate costs, smart growth policies may as well. A better understanding of the forces that have led to the recent popularity of smart growth legislation may improve policy analysis.

References

Anderson, T.L. (ed.) 2000. Political environmentalism: going behind the Green Curtain. Hoover Institution Press, Stanford.

Becker, G.S. 1983. A theory of competition among pressure groups for political influence. *Quarterly Journal of Economics* 98: 371-400.

Bolick, C. 2000. Subverting the American dream: government dictated ASmart Growth@ is unwise and unconstitutional. *University of Pennsylvania Law Review* 148: 859-872.

Caplan, B. 2001. Libertarianism against Economism: how economists misunderstand voters, and why Libertarians should care. *The Independent Review* 4: 539-563.

Coase, R.H. 1960. The problem of social cost. *Journal of Law and Economics* 3: 1-44.

Dowling, T.J. 2000. Reflections on urban sprawl., smart growth, and the fifth amendment. *University of Pennsylvania Law Review* 148: 873-887.

Fulton, W., Rolf, P., Nguyen, M., and Harrison, A. 2001. Who sprawls most? How growth patterns differ across the U.S. The Brookings Institute, Washington, D.C.: 1-23.

Hall, B. and M. L. Kerr. 1991. 19991-1992 Green index: a state-by-state guide to the nation=s environmental health. Island Press, Washington, DC.
Knapp, G.J. 2000. Economics and the smart growth movement. *Virginia Environmental Law Journal* 19: 329-332.

Mulholland, S. 2001. Land trusts: the growth of the non-profit conservancy movement. Clemson University Working Paper.

Myers, P., and Puentes, R. 2001. Growth at the ballot box: electing the shape of communities in November 2000. The Brookings Institute, Washington, DC.

Peltzman, S. 1976. Towards a more general theory of regulation? *Journal of Law and Economics* 19: 211-240.

Polinsky, A. M. 1979. Controlling externalities and protecting entitlements: property rights, liability, rule, and tax-subsidy approaches. *Journal of Legal Studies*, 8 (1), January: 1-48.

Rinehart, J. and J. Pompe. 1998. Private enterprise and environmental amenities: the case of coastal beaches. *The Journal of Private Enterprise*, Volume XIV, (1): 1-16.

Stigler, G.J. 1971. The theory of economic regulation. *Bell Journal of Economics and Management Science*: 2: 137-146.

Yandle, B. (ed.) 1995. Land rights: the 1990s property rights rebellion. Rowman and Littlefield Publishers, Lanham, Maryland.