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# Factors Influencing Support for Rural Land Use Control: A Reply

Donald M. McLeod, Jody Woirhaye, and Dale J. Menkhaus

The comment indicated that landed wealth (acres owned) should be included as an explanatory variable in the zoning referendum estimation. Land can be construed as an indicator of wealth that may be impacted by land use controls. The reply focuses on study site issues as well as theoretic, empirical, and institutional/social considerations. Responses to land use control referenda depend on the land considered, attitudes toward land use planning and socio-demographic factors, including income. The amount of acres owned was not statistically significant in explaining preferences for land use controls in the case investigated by McLeod, Woirhaye and Menkhaus.

Responses to land use control referenda depend on a variety of factors. A potential conflict in deciding support for such referenda may exist between the citizen as current or future landowner and the citizen as regarding public interests (Sen 1987). This case has been modeled using socio-demographic arguments, including income as a proxy for preferences (McLeod, Woirhaye and Menkhaus 1999, hereafter MWM).

Constructive criticism in the comment has been directed at this research for the omission of an indicator of land ownership characteristics, such as acres owned, as a measure of wealth. Citizens are thought to engage in asset protection as they decide about land use controls that may affect the value of their property. This behavior may depend on the type of control being considered, citizen characteristics, the proportion of citizens who own land and the distribution of land holdings.

The omission of a land ownership variable may have important econometric implications with respect to the unbiasedness or validity of the referendum models. The argument presented in the comment about a misspecified model is illustrative

and well known. The reply focuses on theoretic, empirical, and institutional/social grounds. More specifics about this study site beyond those reported in MWM also will be provided.

## Study Site Considerations

There are several factors to consider when examining land use and planning in Wyoming. One must realize that there is a marked difference in property ownership and terrain between lands east and west of the Mississippi. The west, particularly the Great Basin and the Intermountain regions have a large amount of public, and especially federal, land holdings. These lands provide a variety of functions and are held as a public resource. The private undeveloped holdings tend to be large acreage agricultural operations. They provide public goods such as winter wildlife habitat and migration corridors, riparian areas, access to public lands, recreation and scenic amenities as well as cultural resources.

Sublette County, Wyoming is the study site in MWM. It consists of 87% public lands and tends to have U.S. Forest Service holdings in the North. The southern region of the county has Bureau of Land Management holdings mixed with state lands both of which are highly exploited for natural gas. The river and stream valleys generally are private holdings, part of large ranch parcels.

A majority of all who responded to the MWM survey indicated that they would continue to live in

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and/or own property in the county even if the population doubled, though believing they would experience a decrease in the quality of life (McLeod, Kruse and Woirhaye 1998). Seventy-nine percent of all respondents indicated that the management of private lands was at least somewhat of a public matter (McLeod, Kruse and Woirhaye 1998). Respondents appeared to realize the importance and consequences of increased immigration. The nature of land ownership as well as community attitudes towards growth and planning does not readily support land wealth protection behavior.

### Theoretic Considerations

The relevant choice for an individual was posited in the MWM model to occur between two bundles. The goods in each are composites of private and public attributes of land. These composites are assumed to be mutually exclusive, as given below.

$$X_p + X_m = X_i$$

where  $X_i$  is the total amount of attributes and is fixed.

The bundles are state dependent with respect to a public policy or regulation. The regulation is designed to increase the availability of public goods attributes of land. Due to the assumed tradeoff between public and private attributes, the regulation necessarily decreases the private attributes. This reduces the cost to the consumer of consuming the public goods ( $X_p$ ) and increases the cost to the consumer for the private goods ( $X_m$ ).

The following indicates the price and quantity relation:

$$P^0 = (P_p^0, P_m^0) \text{ and } P^1 = (P_p^1, P_m^1)$$

where  $P_p^1 < P_p^0$  since  $X_p^1 > X_p^0$ ; and

$$P_m^1 > P_m^0 \text{ since } X_m^1 < X_m^0 \text{ where:}$$

0 as the initial state or pre regulation/policy and;  
1 as the new state or post regulation/policy;

The above relationship presumes that land use regulation reduces the overall county supply of land available for development. This, in turn, drives up the prices for private attributes of land and rural residential development (MWM, p. 45). Note that the above formulation implies that private property values increase with regulation due to scarcity. The question remains as to whether respondents believe that the regulation will achieve the assumed end, the location of zoned land and who will benefit from the policy.

MWM's approach was to operationalize various

characteristics of citizen decision making, given that individuals make choices to improve their well being. A more inclusive model of individual choice is formulated by the following:

Vote =  $f(\text{public choices, individual choices})$   
where:

Vote = decision on a public policy, yes or no;  
public choices = choices representing societal interests; and

individual choices = choices representing self-interests (MWM, p. 46).

The inclusion of public regarding preference variables in the zoning referendum as estimated by MWM is based on the assumption that individual well being is determined both on a private or non-cooperative basis and a public or cooperative basis. Individuals act to enhance their well being based on their perception of the choices.

One strategy to improve one's well being might be to approve land use controls that preserve open space in their locale (county). This involves some regulatory or market approach that restricts or motivates large parcel landowners to defer or abstain from developing. Note that over 61% of all respondents approved of zoning (MWM).

The Upper Green River Land Trust was formed in 1997. It is a local Sublette County land trust that includes large holdings in the northern region of the county. This outcome indicates that some landowners tacitly agree with the outcome of large lot zoning. They choose to pursue compensation for not developing and for maintaining the current flow of public goods from their properties.

### Empirical Considerations

The number of acres owned was included in the MWM model, as suggested in the comment, with and without the income variable. The acres owned variable neither improved the explanatory power of the model nor was it significant in either specification of the model. The condition indices, as a measure of the presence of multicollinearity, did not change relative to the MWM estimated model.

### Institutional/Social Considerations

The state of Wyoming has modest sales and property taxes but does not have an income tax. Gas and coal tax revenues largely fund the state of Wyoming and the county public sectors. The more residents migrating into a county, the lower the per capita public service and infrastructure expendi-

tures available, *ceteris paribus*. Resident respondents indicated the importance of minerals to the public and private sectors of the county economy (McLeod, Kruse and Woirhaye 1998). Potential county fiscal distress may be an issue when considering the support for land use controls.

There is an institutional element that defines risks and transaction costs pertaining to land values, assets and wealth maintenance/accrual. This may provide an explanation for the lack of statistical significance of the number of acres owned in the MWM model. The state of Wyoming has a 35 acre threshold for development scrutiny. Smaller parcels require that groundwater, soils, slope, drinking water and septic systems' potentials be evaluated (Wyo. Stat. Ann. §§§§§§ 18-5-301-306, 1999).

The distribution of private land holdings in the study site data set is important to understand responses to land use control referenda. Ninety-two percent of the respondents own land and have a direct stake in the land use controls as suggested in the comment. A dummy variable for land ownership therefore would not contribute much in explaining land use control approval due to lack of variation. Thirty percent own less than two acres; 70% less than 13 acres; 80% less than 35 acres; and 88% less than 70 acres. Most landowners are not in a position to sell off even one parcel unless they are willing to deal with aforementioned subdivision laws and permitting costs. Land wealth protection here does not appear to be a motivating factor for most in the disapproval of zoning.

Types of land use preferences (custom and culture of longtime residents or self selection of immigrants who value space) are important in understanding land use control approval. A majority of the survey respondents stated that they live in the county for rural lifestyle, scenery, low population and recreation (MWM). A majority of the respondents indicated that they would not sell three different types of agricultural land, even if it were their land (McLeod, Kruse and Woirhaye 1998). Nearly all respondents preferred agricultural, rec-

reational and wildlife land uses over residential uses (McLeod, Woirhaye, Kruse and Menkhaus 1998). Respondents who were not agriculturalists tended to want agriculturalists to enter into a federal conservation easement program (McLeod, Kruse and Woirhaye 1998). The basis for an individual's behavior and decision-making may be based on the desire for large unfragmented private holdings to remain intact for the good of all. The grounds for land wealth protection, as the basis for land use control disapproval, are not clear in this instance.

## Conclusion

Ownership of land assets should be an important consideration in understanding preferences for land use controls as stated in the comment. This was not the case in Sublette County, Wyoming. Landed wealth's impact on explaining responses to land use controls was uncertain due to the characteristics of the study site as well as theoretic, empirical, and institutional/social reasons previously given. A variety of phenomena may be driving the preferences for land use controls such as land types; attitudes toward land use planning; and socio-demographic factors, including income: acres owned was not one of them in this research.

## References

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