

Hierarchies of Need in Sustainable Development: A Resource Dependence Approach for Local Governance

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ABSTRACT: Urban sustainability is a burgeoning focus for urban scholarship but rarely examined within the larger context of local government economic activities. Why should cities focused on cutback management and competition for tax revenues be expected to devote all but the faintest of attention to carbon footprints or metropolitan-wide environmental or social problems? To address this question, we utilize a resource dependence (RD) theoretical framework to conceptualize sustainable development as a pattern of contractual arrangements between governments and firms shaped by resource constraints. Utilizing survey data of U.S. cities and a novel Bayesian item-response theory (IRT) research design, we examine the incentives underlying municipal commitment to sustainable development policies. We find strong evidence that trade-offs persist between economic development and sustainability policies, and varying economic development activities influence the breadth and scope of sustainability policy commitments.

Keywords: Urban sustainability, economic development, social equity, resource dependence.

An Introduction: City Sojourns Toward Sustainability

Cities today face a confluence of constraints and opportunities to sustain their service-delivery. Despite the pressure to do more with less, some local governments have demonstrated a willingness to experiment with sustainable policy choices targeting government, households, commercial/industrial sites, and utility sectors along the lines of energy, land use, transportation, economic development, food, water, and waste recycling (Campbell 1996; Portney 2013). Yet there is a considerable theoretical void in explaining city sojourns toward sustainable development (Deslatte and Swann 2016; Opp 2016; Homsy and Warner 2014; Warner and Zheng 2013). Confronting the lingering effects of the Great Recession and globalization, scholars have questioned whether ‘austerity urbanism’ and cutback management have become a post-recessionary way of life for many cities (Donald et al. 2014; Peck 2013; Warner and Zheng 2015). A “sustained” focus on sustainability may be subjugated to pressing concerns like growth and development, fiscal health and innovative methods for delivering core public services with fewer resources. Why should cities focused on cutback management and competition for tax revenues be expected to devote all but the fleetest of attention to carbon footprints or metropolitan-wide environmental or social problems?

To address this question, we utilize a resource dependence (RD) theoretical framework to conceptualize sustainable development as a pattern of contractual arrangements between governments and firms shaped by resource constraints. Cities are dependent upon their environment for resources to provide a wide range of public goods: amenities like parks and open spaces; cleaner air and living spaces; reduced traffic congestion; financial savings from reduced energy use (Portney 2013). However, environmental public goods suffer from “product uncertainty” surrounding cost, quantity and quality in negotiating with private firms (Brown,

Potoski and Van Slyke 2009). We argue the concept of urban sustainable development can be characterized as a type of complex product with many of the costs borne in the present and the benefits deferred to the future. Sustainable development may contrast with traditional forms of local government business recruitment, where costs are often incurred in the future while benefits are intended to accrue in the present. As such, sustainable development by local governments and employers confronts distinct resource constraints and transaction costs.

Dependent upon the resource needs and bargaining power of cities, we find evidence that: (1) trade-offs persist between economic development and sustainability policies; (2) resource constraints and competition differentially account for those tradeoffs; and (3) varying economic development activities influence the breadth and scope of sustainability policy commitments. Utilizing survey data of U.S. cities and a novel Bayesian item-response theory (IRT) research design, we examine the incentives underlying U.S. cities' commitment to economic development, social equity and environmental policies and present evidence that sustainability represents a higher-order goal in the "hierarchy of needs" for cities.

Sustainable Development and Resource Dependency

Economic development occupies a place of primacy in local government activity (Bartik 1991; Peterson 1981; Stone and Sanders 1987). Cities turn to economic development programs to help provide fiscal benefits to government and jobs to residents, prompting urban scholars to consider growth motives a paradigm for understanding local government policymaking (Logan and Molotch 1987). Cities with higher levels of poverty or unemployment, greater reliance on sources other than property tax, and greater competition for development have been historically shown to seek quicker revenue benefits by using tax-incentives to attract firms (Fleischmann, Green and Kwong 1992; Rubin and Rubin 1987; Stokan 2013).

Diverging from the “growth machine” perspective, an increasing number of cities since the 1990s have started leveraging economic growth to provide environmental amenities or quality-of-life benefits (Mazmanian and Kraft 1999; Portney 2013). Sustainability, as defined by groups such as the United Nations World Commission on Environment and Development (Brundtland Commission), normatively proposed that trade-offs between environmental protection and economic development objectives were no longer valid in a world confronting climate change, globalization and rapid population growth (1987). Moreover, sustainability developed as a menu of policy prescriptions for nations and local governments through reports such as the U.N.’s *Agenda 21* (1991) and networks such as the International Council for Local Environmental Initiatives (ICLEI)-Local Governments for Sustainability, which counts more than 1,500 member governments globally (Yi, Krause and Feiock 2016; Zeemering 2014). Yet, it is unclear whether cities have continued in a zero-sum pattern of trade-offs, or if they are integrating economic development and sustainability strategies to produce mutual gains.

Resource dependence theory (RD) essentially holds that organizations need resources to survive, those resources are held by other organizations in their environment, and the power of an organization is inversely related to its external resource needs (Pfeffer 1971; Pfeffer and Salancik 1978). Organizations seek relationships with others in order to gain access to resources within these environments of relative scarcity. Applied to public organizations, municipalities compete with other local governments to attract and retain development, and thus work to minimize power dependencies or maximize their power over other participants in such environments. We argue an RD approach is an appropriate lens for studying local economic development, because city officials play asymmetrical roles in the pursuit of development to support their tax bases and maintain or enhance services (Bartik 1991). In economic downturns

where resources are declining, cities may not be able to easily locate viable alternative sources. Cities facing high immediate resource needs or high competition for resources (or both) often wield relatively weak bargaining power with development interests. But when scarcity or competition are lower, cities' experience enhanced bargaining strength and may seek to manipulate this power dynamic in ways that increase their long-term sustainability.

Local governments can contract with individual firms to create or retain jobs via incentives such as tax abatements, or through broader strategic initiatives which use taxation, expenditure and regulatory policies to benefit specific clusters or industries (Bartik 2003). Cities with few fiscal resources suffer from power asymmetries and may focus on basic economic development policies, selecting those which require no immediate outlay of cash (e.g. tax abatements, tax increment financing). They are essentially borrowing from the future, and their primary concern is actually jobs over revenues. In part, this is exhibited by their use of policies that will forego future revenues to some extent.

Similarly, some sustainability policies (infrastructure investments financed through debt) can produce benefits which are realized earlier and costs borne on populations in the future, although the inverse may be more common (for example, future air and water quality which require immediate investments). As cities begin to establish some financial security, sustainability policies that are utilized may be very basic, such as LEED certified buildings and energy efficiency standards. Basic levels of security may necessitate policies with benefits now and future costs (tax abatements, TIFs, etc.) or it could include basic loans or a focus on existing firms and even small business development.

As cities gain financial security and satisfy basic job needs, their power position is enhanced as their resource dependence is diminished, allowing a greater array of potential policy

choices. Extant research in the United States suggests cities' economic development strategies have evolved in a series of "waves" (Bradshaw and Blakely, 1999; Blakely and Green Leigh, 2010; Clarke and Gaile, 1992; and Olberding, 2002) from 'quick-fix' industrial business recruitment using traditional tax incentives to more targeted retention and expansion policies to entrepreneurship and cluster development and ultimately to redistributive, community-wide development activities which may include sustainability (Bradshaw and Blakely 1999; Zheng and Warner 2010). Recognizing that tax bases are not vastly improved if too much is given away to business, municipalities may make efforts by providing investments to existing firms and pursuing entrepreneurial type policies (incubators, entrepreneurship programs, trainings, etc.). They may have better infrastructure for these policies, and can thus engage in business retention surveys and develop accountability plans. This may also result in greater sustainability efforts, although probably not the most ideal sets of policies.

Firms are also more willing to voluntarily adjust activities and goals relative to their developmental, ecological, and social impacts (Hammer and Pivo 2016; Osgood et al 2016). Businesses have recognized the long-term benefits of becoming more attuned to "Triple Bottom Line," or Profit, Planet, People (PPP) strategies which stress the inter-jurisdictional and inter-generational obligations of companies to preserve the environmental systems necessary for economic growth (Hammer and Pivo 2016). For instance, developers might recognize that preserving environmental amenities make their projects more appealing to consumers (Lubell, Feiock and Ramirez de la Cruz 2009). For a host of reasons, businesses have taken a greater interest in preserving ecological systems they depend on for resources, quality of life, and equitable development (Carley, et al. 2011; Osgood, Opp, & Bernotsky, 2012).

In his analysis of the 54 largest U.S. cities, Portney (2013) provides some linkage between economic bases of cities and sustainability, finding those with larger manufacturing job bases take fewer sustainability policy actions. Utilizing International City/County Management Association (ICMA) survey responses from 1,497 cities, Homsy and Warner (2015) conclude the opposite -- that economic development and sustainability policy choices are not directly related, largely because manufacturing-dependent communities appear no less likely to adopt sustainability policies. Using ICMA economic development and sustainability survey data from 2009-10, Osgood et al. (2016) provide another argument for a linkage by disentangling the policies: cities indicating they utilized sustainability for economic development purposes were more likely to act across a spectrum of anti-pollution, smart-growth, transportation, energy and administrative policy domains, although they were constrained by their economic bases, inter-governmental competition, and the perceived co-benefits of the policies themselves. In this sense, cities may be strategically turning to economic-development to co-produce environmental public goods they may otherwise be less likely to provide internally.

This does not mean to suggest cities and companies are marching lockstep into a sustainable future. We may see movement toward community-based efforts. However, ample resources may not be enough if combined with greater competition. Recent evidence suggests that during economic slumps cities may return to this earlier, recruitment stage (Reese 1998; Warner and Zheng 2013). From a resource dependence perspective, coordination costs may be higher in the face of increased competition because companies hold greater information advantages. Companies should also be advantaged in negotiations when cities face greater challenges to offset revenue declines during periods of austerity. Thus, both competition and resource scarcity may prompt cities to fall back into more traditional tax-incentive recruitment

strategies (Malatesta and Smith 2014). Alternatively, high levels of perceived competition combined with high levels of resource munificence may lead to a mixed strategy where these approaches are pursued simultaneously with some of the more basic approaches (tax abatements, TIFs, tax exemptions, etc.). Understanding sustainable development as a contractual exchange allows us to explore how cities seek to minimize problems of measurability in the face of competition (Dixit 1996; Feiock and Clingermayer 1992).

We modify RD to the extent that we model local governmental trade-offs between economic development and sustainability *policies*. Therefore, we are substituting policy choices for the traditional unit of analysis in RD studies (structure of exchange) and transaction-cost economics (internal and external production). We argue this is not a major alteration, based on the contractual nature of most economic-development incentives as well as the established body of work on political markets which treats policy choices as contractual exchanges between policymakers and policy demanders intended to maximize benefits to the parties (Leon-Moreta 2016; Lubell, Feiock and Ramirez de la Cruz 2009; Stein 1990). Local government policies shape the environment by creating constituencies who benefit from policy actions and will defend them (Dixit 1996). Our approach explores the extent to which these policy exchanges can be explained by varying degrees of external control over an organization based on its resource needs.

The Benefits (and Costs) of Foresight

A central implication of applying resource dependence theory to local governance is that present or near-term scarcity and competition are stronger influences on city development strategies than longer-term needs, and cities will be more likely to comply with demands of firms to gain resources sooner rather than later (Pfeffer and Salancik 1978; Malatesta and Smith 2014). Local

governments routinely confront uncertainty over their fiscal future, and RD implies city policymakers seek development strategies which allow them to manage these dependencies. Sustainable development in this context can be explored as a management strategy to gain leverage over the long-term resource stability of the community. The act of awarding incentives is a contractual endeavor intended to generate a net gain of resources (jobs or revenues). However, any contractual exchange is not frictionless, and economic development policies can have differential benefits and costs over time. Our adaptation of the resource dependence perspective, thus, highlights several key factors which may influence the timing for when sustainable development policies emerge: *resource munificence*, *competitor concentration*, and *interconnectedness*.

Resource Munificence

Management theories have generally posited that resources are fungible when in short supply (Klein 1990). When resources are abundant, cities may disentangle their strategies to confront fiscal challenges and develop their local economies by providing benefits employers need: regulatory certainty, labor screening and training, expedited permitting and zoning, in addition to land and tax breaks. These investments all share several characteristics: their benefits are more spread out over time rather than immediate; their costs may be incurred sooner or spread out over time; and they distribute their benefit to citizens and places rather than just firms. Cities with such slack resources can be more selective in the types of employers they court, and place a higher priority on social needs and sustainability. As cities shift focus from specific firms to broader community-wide goals, strategies will be more inclusive of low-wage labor and social responsibilities. A central view of RD is that dependences are loosened by diversification. We expect to see a positive relationship between cities engaging in community- and small-business

economic development and those enacting sustainable development policies which may deliver benefits in the short term, which loosen dependency on “growth machine” strategies. We posit that cities utilizing more community-development strategies will adopt a higher number of energy efficiency, land-use and social inclusion policy tools (H1). Likewise, we hypothesize cities utilizing more small-business development strategies will adopt a higher number of energy efficiency, land-use and social inclusion policy tools (H2).

Resource munificence moves re-locating firms closer to monopoly control over the economic resource cities need. When resource scarcity is greater (as in a recession), city officials will treat potential sources of revenue in the environment more interchangeably. Cities will have less leverage over employer locational decisions, and will be more likely to turn to more conventional recruitment/attraction incentives such as tax abatements, tax-increment financing or discounted land. The characteristics of these activities may differ from longer-term strategies: they are perceived to deliver benefits sooner; they defer costs into the future; and benefits are targeted toward firms while costs are dispersed widely among taxpayers. These incentives are often associated with a “race to the bottom” approach as cities struggle to generate revenue and devote more resources to chase “quick fix” economic development deals. Political economics also suggests the diffuse nature of the costs for these policies -- spread out on a per capita basis to all taxpayers -- creates a disincentive for citizens to oppose them. Sustainability strategies depend on some type of prioritization of short- and long-term objectives and a willingness to invest current resources into inter-generational benefits. When the costs of planning, implementing and monitoring sustainability measures are deemed to be too high, local governments will favor more conventional, short-term, firm-targeted recruitment/attraction

tactics. We posit cities utilizing more business attraction/recruitment incentives will adopt a lower number of sustainability tools overall (H3).

Competitor Concentration

Competition is distinctive from munificence in that it influences the transparency of the resource exchange. As a means to attract manufacturing firms from the north, southern states began using tax abatements as early as the 1930s (Loveridge and Nizalov 2006). Prior to the 1980s, business recruitment, or first-wave strategies, focused on tools used to incentivize firms to relocate or expand within a locality, and may include tax abatements, credits, free or reduced-price land, direct payments for relocation or tax-increment financing (cite). Questions have persisted over whether tax incentives are effective at growing local economies. Despite challenges to their effectiveness, firm-directed economic development incentives have become so prevalent in U.S. cities, communities in the same metropolitan regions are often pitted against one another by opportunistic firms with locational alternatives (Watson 1995; Wolman and Spitzley 1996; Zheng and Warner 2010).

Cities reliant on incentives have also tended to be in more competition for development, with lower tax bases and growth, leading some researchers to posit that these localities are engaged in a race to the bottom (Zheng and Warner 2010). Cities with lower tax revenues, increased competition and greater barriers to development have been shown to utilize more tax incentives (Warner and Zheng 2013). Competition, in particular, may tilt the bargaining power of municipalities in favor more towards businesses which have a higher number of locational alternatives and more ability as private organizations to disguise their intentions. In periods or regions characterized by greater governmental competition, employers have an advantage in negotiations and governments suffer from greater information asymmetries. We posit cities

facing greater competition for economic development will have less leverage to contract with employers for sustainability and adopt fewer sustainability policy tools (H4).

Organizational Interconnectedness

Alliances and trust between potential competing organizations are likely to influence sustainable development activities. Alliances allow for sharing information and coordinating activities between parties pursuing similar goals. Alliances are less formal than mergers or consolidations, but require more coordination than co-optation strategies such as volunteer boards. In urban governance, there is a voluminous literature on the value of collaboration to confront the negative ramifications of competition for economic development (Krause 2011b; Ostrom 1996; Wang et al 2012).

Alliances may be formal or informal, and can involve absorption to some degree of potential rivals or resource providers. Alliances or collaborative efforts on the part of local governments to coordinate economic development may be advantageous from an RD perspective because they are flexible and allow the parties latitude to leave the alliance. Hawkins et al. (2015) explore the extent to which several institutional theories of sustainability hold leverage and find network governance through organizations such as ICLEI to be related to greater sustainability commitments, although these commitments may not be directly related to performance (Yi, Krause and Feiock 2017). ICLEI's voluntary Climate Protection program is a prominent example, peaking in municipal membership in 2010 before cities began terminating their memberships over perceived ideological differences and ineffectiveness (Krause, Yi and Feiock 2016).

Interconnectedness can also involve a range of participation with actors outside the organization, from informal information-sharing between governments, to consultation and input

from varied community groups and civic leadership, to joint partnerships. Citizen participation in government decision-making (Portney and Berry 2010), and the organization of impacted business and community interests (Sharp, Daley and Lynch 2010) have both been linked to sustainability actions. Each of these arrangements allow public managers to more effectively scan their environments and adapt to changing conditions, thus reducing the information asymmetries which heighten the firm's bargaining power in periods of scarcity. This sustainability research suggests cities experiencing higher level of participation from businesses and community groups in economic development strategies will adopt a higher level of energy efficiency, land-use and social inclusion policy tools (H5a). However, this research has not explicitly extended the role of public engagement in economic development to sustainability. Heavy interest-group lobbying could bring about a larger number of economic development policies. Thus, tradeoffs may reduce the number of sustainability policies. If, however, the area is resource rich and/or facing low competition, adoption of both economic development strategies and sustainability efforts could be simultaneous strategies. Given the lack of guidance in the literature, we also offer the alternative hypothesis that cities experiencing higher level of participation from businesses and community groups in economic development strategies will adopt a lower level of energy efficiency, land-use and social inclusion policy tools (H5b).

Alliances also reduce potential competition by forming joint strategies to arrest the "race to the bottom" and encourage sustainable economic development strategies. We hypothesize that cities engaging in higher levels of inter-governmental participation with other local, state and federal governments in economic development strategies will adopt a higher level of energy efficiency, land-use and social inclusion policy tools (H6).

Geography also impacts the inter-connectedness of cities. Rural, urban and suburban cities have shown differing levels of sustainability activity, with suburban cities appearing less likely to make commitments to sustainability than central or rural cities (Homsy and Warner 2015). Homsy and Warner argue this is because suburban cities -- which are more likely to be politically, racially or income stratified -- are able to free ride upon the sustainability efforts of central cities, while rural municipalities are left to their own policy devices. Education and civic involvement thus play a stronger role in rural municipalities (Homsy and Warner 2014; Osgood, Opp and Demasters 2016). Other research suggests suburban governments face diseconomies of scale in the production of many public goods due to fragmentation, which can extend to sustainability (Deslatte 2016). Because municipal fragmentation can both increase competition, along with policy learning from peers and the potential for collaborative action, we expect to see an interactive effect for where the city is located within a metropolitan region. Rural cities face comparatively less competition from their neighbors than suburban and central cities, while suburban cities may face more spillovers and diseconomies of scale. We posit rural and central cities engaging in more community- and small business-development strategies will also engage in more energy efficiency, land-use and social inclusion policy tools (H7a). However, suburban cities engaging in more community- and small business-development strategies are hypothesized to use comparatively fewer energy efficiency, land-use and social inclusion policy tools than their urban and rural counterparts (H7b).

Varying levels of support have been found for state-level policy steering (Homsy and Warner 2014; Krause 2011b) and local institutional arrangements empowering unelected managers (Deslatte, Swann and Feiock 2016). Resource dependence theory supports much of the form of government literature by positing managers play both responsive and discretionary roles

in adjusting their organizations to resource needs. RD theory is premised on an organization managing its dependency by seeking alternative routes to sustainability. Cities with council-manager forms of government have been shown to influence policy choices on the margins within their jurisdictions (Carr 2013), primarily on issues of fairness in the distribution of public services. We therefore hypothesize that managerial governments will generally engage in higher levels of social inclusion policy tools than cities with alternative forms (H8).

Data and Methods

To test the utility of a resource dependence approach, we utilize a combination of archival and ICMA survey data. A 2009 ICMA economic development survey and a 2010 sustainability survey mailed to all U.S. cities and counties with populations over 10,000 were matched for cities responding to both surveys (N=419). This allows us to test hypotheses for how economic development strategies reported by cities are associated with their sustainability activities with minimal risk of reverse causality. Extant economic development research by Osgood et al. (2016) and sustainability research by Homsy and Warner (2015) and others has used either one of these surveys in isolation or both in a limited, descriptive analysis. None have used the matched responses in a regression context to explore sustainable development.

We advance their work with a Bayesian application of Item Response Theory (IRT) to accurately scale municipal commitment to differing sustainable development strategies. Sustainability and economic development research have both suffered from designs relying on additive indices of policy tools, thus equally weighting activities which require differing levels of resource commitment -- raising water rates for conservation versus building bicycle lanes, for example (Deslatte and Swann 2015). IRT models, first used in psychometrics, have been employed in the social sciences to assess political ideology, government transparency, and other

latent social traits which are not directly observable but may be indirectly calibrated through the weighting of test items (Armstrong et al. 2014; Clinton, Jackman and Rivers 2004; DeMars 2010). The most common IRT approach is the Rasch model, which determines the probability of a correct response based on both the ability of the respondent and the difficulty of the item. IRT models allow for the differential weighting of sustainability and economic development policy tools based on each city's commitment to those strategies and the relative level of difficulty for each activity or tool. IRT models can be a useful advancement of this research because they allow for a more appropriate scaling of the dimensions of cities' commitment to these oft-competing goals.

We then fit Bayesian linear regression models for five categories of sustainability policies. Bayesian and Frequentist approaches basically differ over assumptions about how data are generated; Bayesians see the world as comprised of observed data which are fixed and unobserved phenomena which must be estimated (for a detailed justification of the method, see Gill and Meier 2000; Gill and Witko 2013; and Wagner and Gill 2005). The Bayesian paradigm is ideally suited for public administration and policy research, due to its reliance on observations of fluid events rather than the Frequentist assumption of repeatable data-generating processes more suited for experimental studies (Gill and Meier 2000). For instance, the surveys for this study were administered during the tail-end of the Great Recession, and likely capture municipal activities during a unique period of fiscal stress and uncertainty. We treat these data as fixed and the parameters for the factors under investigation as random variables estimated by our models. Bayesian inference further allows for the addition of prior knowledge (previous experiences of managers, for instance) into the estimation of our posterior outcome parameters (sustainability activities). Here, we chose to use non-informative or diffuse priors in this study to alleviate any

concerns over the subjectivity of using prior information to influence our results. The primary utility of the Bayesian statistical approach here is the ability to make more intuitive, probabilistic statements about unknown parameters of interest.

Outcome Measures

Our outcome measures are values for city commitments to five indices of sustainability tools, weighted for respondent cities via predicted latent traits generated with empirical Bayes mean scores. We created five sustainability tool bundles (overall sustainability for comparison, carbon-emission reduction, energy efficiency, building and land-use, and social inclusion). The IRT models produced different weights for each item within these categories by calibrating the differing “ability” or commitment of each city with the difficulty of each activity. For instance, Figure 1 displays two Item Characteristic Curves for carbon-emission reduction activities (left) and energy-efficiency measures (right), with the mean “ability” of cities represented at 0 on the x-axis. From the carbon-emissions characteristic curve, we see as cities approach the probability of 1 that they will engage in tree preservation or planting activities, the chance they will also set greenhouse gas reduction targets for multi-family housing projects is less than 20%. With energy-efficiency measures, a respondent city with average “ability” has a 90% chance of conducting energy audits of government buildings but less than a 10% chance of installing geothermal heating and cooling systems. Thus, each item in the scales is weighted according to difficulty.

[Insert Figure 1 here]

The survey measured 109 sustainability policy actions or goals across 12 issue areas, which we combined in one item-response model to create a *comprehensive sustainability* outcome measure. Because strong theoretical and methodological arguments suggest these issue areas should be treated as separate dimensions, we conducted exploratory factor analysis and combined items creating four additional outcome measures (Deslatte and Swann 2015). Our *energy* index includes 17 survey items related to fuel-efficient vehicle use, energy management systems, lighting, solar panels and energy audits of government buildings, among other actions. Our *carbon* index contained eight questions related to greenhouse-gas emissions benchmarking and targets for the municipal government and community. Our *land use* index contained 19 items related to incentives for smart growth, construction standards for energy use, brownfield sites, land conservation programs, and transfer of development rights programs. And our *inclusion* index included eight items covering affordable housing; housing options for the disabled, homeless and elderly; pre-school funding, after-school programs; and community quality-of-life information provision (for a detailed description of the 2010 ICMA sustainability survey and its utilization, see Homsy and Warner 2015; Opp and Saunders 2013; Osgood, Opp and Demasters 2016; and Svara Watt and Jang 2013).

Explanatory Measures

The 2009 economic development survey included 105 items dealing with policy actions, barriers to development, competitors and participation in economic development strategies which we used to create explanatory variables.

We utilized IRT modeling to generate five distinct economic development strategies (incentives, business retention, community development, accountability measures, and small-business development). Our *incentives* index included 18 items asking whether cities offered

firms tax abatements, credits, tax increment financing, enterprise zones, free or reduced land, grants, zoning/permit assistance, and regulatory flexibility, among other recruitment tools. The *retention* index included 10 items covering business roundtables, revolving loan and local business publicity programs, export development assistance and partnerships with chambers of commerce or other local governments. The *community development* index comprised nine items, including use of community development corporations, community development loan funds, environmental programs, transit options, job training affordable housing and high quality physical infrastructure. Finally, the *small business* development index comprised nine items, including a revolving loan program, small business development center, business incubator, microenterprise program, vendor/supplier matching, marketing assistance and management training.

To examine resource munificence, several composite measures for resource constraints were included in the models. The survey asked whether 19 different factors were barriers to economic development encountered by local governments. Based on our EFA, we used these responses to create four IRT barrier measures for perceived market/lifestyle *decline*, a *cost* measure capturing the barriers posed by labor costs, housing or environmental regulations, a *tax* measure capturing the lack of capital/funding and taxes, and a *land* measure capturing land and building availability.

Because not all competitors for economic development are equal, we also created a *competition* item-response measure which captured competition from nearby local governments, those outside the state, and foreign countries. Increased competition for jobs is one theoretical explanation for the use of tax-incentives to recruit new employers. However, our Pearson's correlation coefficient matrix showed weak to no relationship between our competition measure

and small-business, retention, recruitment incentives, accountability and community development measures ($.28 \leq r \leq .33$). Based on our factor analysis, we also created two IRT measures capturing the extent of *business participation* and other local, state or federal *government participation* in economic development.

We included dichotomous measures for whether respondent municipalities were considered *suburban* or *rural* in character, utilizing the ICMA economic development survey's third category for central cities as the reference group in our models. In order to examine potential differential effects on sustainable development for city types, we then created interaction terms for these city types and their levels of community development and small-business development activities. A dichotomous measure for *ICLEI* membership was included to control for the network membership influence previous studies have explored with the sustainability dataset.

Finally, we utilized U.S. Census data to include measures for *population* and *population change* from 2000 to 2008, as well as creating *ethnicity* and *age* diversity indices similar to the Herfindahl-Hirschman index (HHI), which was designed to capture market concentration. A higher score in either the ethnicity or age index reflects greater concentration of one subgroup in the overall city population. So a city with a higher ethnicity index score is more racially/ethnically homogenous, while a higher score in the age index reflects more similarly aged residents (capturing, for instance, a traditional retirement community). All descriptive statistics are provided in Table 1.

[Insert Table 1 here]

Results and Discussion

Resource dependencies and organizational strategies to manage them appear to play a significant role in sustainable development choices. We find evidence that cities surveyed engaged in trade-offs between incentive-based business recruitment strategies and sustainability activities across our policy areas. Conversely, cities which engaged in more community development and business retention efforts were also more likely to take broad sustainability actions. Results for the five Bayesian OLS models are reported in Table 2. Bayesian estimation involves specifying a prior distribution for an unknown parameter, and then updating it by multiplying the prior by a standard likelihood function using new data. This updated posterior distribution generates a mean, median, standard deviation and Monte Carlo standard errors, and posterior results rely upon both the central point of the distribution and the dispersion. This allows for a more informative summarization of the findings based on probability statements (Gill and Witko 2013). Bayesian analysis relies on a stochastic Markov Chain Monte Carlo (MCMC) simulation process, and we used the Metropolis-Hastings sampling algorithm. To aid with model convergence, we ran 600,000 MCMC iterations with a 100,000 “burn-in” period for each model. Diagnostic plots displayed good trace-plot mixing and low autocorrelation, suggesting model convergence.

[Insert Table 2 here]

Resource munificence

We find that cities utilizing more community-development strategies will adopt a higher number of sustainability policies overall (Model 1), and this relationship appears strongest with social inclusionary tools (Model 5) where a Bayesian interval hypothesis test finds a 99.9% chance of observing a positive relationship. The evidence is less convincing in our land-use (Model 2),

energy (Model 3) and carbon models (Model 4). For instance, we find an 89% chance community development efforts have a positive influence on smart-growth activities, an 83% chance it positively influences energy-efficiency steps, and an 85% chance it positively influences carbon-reduction actions. Overall, this suggests a motivational linkage between community-development and sustainability which is strongest for social inclusion policies.

The evidence for H2 is weaker. We find a 76% chance that small-business investment will be associated with carbon-reduction actions, but the probability of the expected relationships between small-business support and land-use, energy and social inclusion amounts to essentially a coin flip. Business retention efforts also provide support for homegrown and existing employers, a second-wave economic development strategy which reflects heightened power in the economic relationship. We find that higher use of retention strategies such as business roundtables, revolving loan programs and export assistance is related to greater commitment to sustainability measures overall as well as carbon reduction. We observe a 96% chance employer-retention strategies are related to energy efforts, and a 97% chance they are associated with inclusionary policies.

The relationship is the opposite for first-wave economic strategies. Cities utilizing more business attraction/recruitment incentives are less likely to adopt sustainability policies across all areas (H3). This evidence suggests a clear tradeoff for cities between investing in economic development strategies with short-term payoffs and those representing investments in future benefits.

In order to capture scarcity, we also examined the extent to which the perceived lack of land, labor and capital resources influenced policy choices. We found an 88% chance that the cost or lack of available land and buildings *positively* influenced the willingness of cities to

engage in green building and smart-growth policy actions. To make sense of this, we must consider that cities more likely to experience these barriers are landlocked and must rely on redevelopment rather than greenfield development to attract employers. The top two most utilized tools within this policy bundle were mixed-use zoning and programs for revitalizing abandoned property. This suggests cities faced with less land for development were more likely to turn to these tools to increase densities or rehabilitate under-utilized or contaminated sites. We also observe a 93% chance cities where land is scarce will also utilize more energy efficiency measures such as energy management retrofits and more efficient traffic signals or light fixtures, which fits with this explanation since cities redeveloping their land may incorporate more modern energy technologies when doing so. Lack of capital, meanwhile, appears to make it more difficult for cities to make energy and carbon-reduction commitments. These findings cumulatively show the value of a resource dependence explanation for the circuitous paths cities take toward more sustainable development.

Competitor Concentration

We expected cities facing greater competition for economic development to have less bargaining leverage in contract bargaining with employers, and as a result they would adopt fewer sustainability policy tools (H4). We find evidence of this in the case of land use alone. Cities which report facing higher levels of competition from other local governments generally made a lesser commitment to using green building and smart-growth policies to steer development. Because these green building activities typically involve regulatory or zoning restrictions on development, a resource dependence perspective suggests cities would have less power to enact them when confronting developers have more alternatives for where to invest their capital. From this perspective, incentives for energy efficiency or carbon-reduction goals for governments may

be less impacted by competition for economic growth than governmental policies which directly guide or constrict the property rights of businesses.

Organizational Interconnectedness

Alliances are one method for managing resource dependencies. We find limited evidence that business and governmental participation in economic development strategies influence sustainable policy choices. When business groups are perceived to be more involved in city economic development activities, cities are more likely to use a wider array of social equity policies (H5a). We expected that cities participating with other local, state and federal governments in economic development strategies will adopt a greater number of sustainability policies (H6). We find no such relationship, suggesting economic development partnerships across governments were not directly influencing sustainability choices during the study period. We do find a 99.9% chance ICLEI member cities will use more energy policies and an 82% chance they will take carbon-reduction steps. Despite the voluminous literature on governmental collaboration and capacity-building, this weak evidence illuminates the need to continue exploring when community capacities and collaboration make a difference in sustainability policy commitments. For instance, this study context -- the aftermath of the Great Recession and reliance of local governments on billions of dollars from the federal American Recovery and Reinvestment Act of 2009 -- may distort the extent to which cities normally engage in collaborative economic development activities to minimize their resource dependencies.

The results for suburban-versus-rural government run largely counter to our hypotheses (H7a, b). Suburban cities are the largest swath of respondents in our merged dataset (65.9%), operating in highly fragmented metropolitan environments. We find some evidence suburban governments investing in small-business development were less likely to utilize carbon and

inclusion policy tools. However, suburbs investing in community development were more likely to take energy-conservation steps. This suggests suburban governments may free-ride on the sustainability efforts of other governments, but choose to make targeted investments when the benefits may be internalized. Policy tools aimed at reducing greenhouse-gas emissions or sprawl essentially subsidize a global or regional good. Energy efficiency actions are captured by the locality, firm or household. Suburban cities have been historically accused of enacting policies that have the effect of “excluding” lower income and ethnic-minority communities. Intuitively, suburbs willing to invest in community development projects such as affordable housing, childcare and job training may also take an interest in a limited range of sustainability measures. This makes for a more complicated trade-off than we see with cities generally choosing between “quick fix” business recruitment and long-term sustainability.

The results for rural municipalities differ somewhat. We find a 71% chance rural communities will take more smart-growth actions than central cities (the reference group in our models). Rural communities investing in small-business development -- rather than community development -- were 69% more likely to also invest in energy measures. These communities were also more likely to invest in social inclusion policies which contain some overlap with community development (provision of affordable housing, for instance). Rural communities face less direct competition from neighboring governments and more pressure from urban migration and the transition of the U.S. economy away from manufacturing and agriculture. This reality is reflected in our measure of “decline,” which captured perceived barriers to economic development posed by a lack of skilled labor and major employers, distance from major markets, and quality-of-life erosion from inadequate recreation, cultural programs or education. Our

results suggest communities perceived to be in decline make less of a commitment to sustainability in general, and particularly to energy and climate efforts.

Lastly, we included several measures common to the local government sustainability literature. We find evidence that cities with a manager-council form of government will generally advance more policies addressing social inclusion (H8), which is consistent with extant research (Carr 2015; Deslatte, Swann and Feiock 2016). Manager-led governments do not display a tendency to engage in other sustainability policies more frequently than other forms, and we find mayor-led cities were less likely to engage in carbon-reduction activities. Among our socio-economic measures, population was generally positively associated with sustainability tools, while higher values for ethnic concentration was negatively associated with our sustainability tool index, as well as with the carbon-reduction model. Communities which were more race-ethnic homogenous were less likely to make these sustainability commitments, consistent with extant research.

Conclusion

Cities face unprecedented fiscal challenges in coming decades, and are beholden upon their environment for the resources necessary to achieve sustainability. Urban sustainability assumes local governments have the foresight to marshal financial, political and community capacities to curtail service-delivery and spillover problems (Feiock and Stream 2001; Krause 2011a; Opp and Saunders 2013). But the U.S. federalist system does not produce municipal doppelgangers; no two cities look or behave identically. And the ethos of sustainability runs counter to a long argued zero-sum growth paradigm: localities with greater need to devote effort to producing immediate economic gains may do so at the expense of providing for longer-term social and environmental goods (Howell-Moroney 2008; Molotch 1976; Peterson 1981). A resource

dependence theoretical approach provides new insight into the urban sojourn toward sustainability by framing local government decisions as contractual processes through which public organizations attempt to manage their resource dependencies via mixtures of economic development and sustainability policies.

We find strong evidence cities in greater need of economic development utilize the shortest-range tools and are more likely to avoid sustainable development actions. Cities which utilize a greater number of tax incentives for economic development will make less of a commitment to carbon-reduction, smart-growth, energy efficiency and social inclusion policies or goals. Because the gains from sustainability are often more difficult to quantify, the cities willing to make greater commitments to these policies are generally those which have transitioned their focus to preserving or growing internal businesses. However, this is not uniformly so.

Our findings have strong implications for cities charting the best way forward. Resource dependency theory suggests an inverse relationship between resource dependency and leverage in interactions between governments and other actors; however, it also recognizes the importance of fostering relationships with actors to access different resources. Cities can continue to pursue traditional incentives to attract and recruit firms as a first-wave strategy, to the detriment of the region and often not to great economic benefit of the cities. Alternatively, sustainability initiatives may be a management strategy which works in tandem with second and third-wave policies. While our analysis suggests cities are treating recruitment and sustainability strategies as alternative solutions, they need not be. Cities have grown wise to including local hiring provisions and even clawback provisions for failure to achieve the desired number of jobs; however, in times of great financial constraint governments are hesitant to enforce these

provisions because of the global economic constraints on these businesses. Instead, cities could pursue realistic provisions requiring sustainability provisions with better long-term payoffs. This would better align the long-term future costs with the long-term future benefits that are inherent in these strategies. Our implications at first blush seem to suggest that political fragmentation may be less of a problem for the provision of sustainable public goods relative to economic development pursuits, evidenced by a diminished role of governmental competition as a factor, however, competition seems to have both direct and indirect effects via the direct impact on land use sustainability policies and the differential adoption of first-, second-, and third-wave policies. Consistent with the literatures on intra-metropolitan economic development efforts and also the pursuit of sustainability policies, we echo the importance of regional solutions to better align the short- and long-term costs with the short- and long-term benefits between economic development and sustainability efforts at a regional scale.

Our findings lead to several additional lines of inquiry which were beyond the scope of this study. First, we do not account for the actual pricing of short- and long-term benefits in the face of asset specificity and measurability problems. Contracting for complex goods like sustainable development involves both value and cost uncertainties (Brown, Potoski and Van Slyke 2009). When cities act as buyers of sustainable economic development, they attempt to contract for projects that provide both jobs and environmental amenities based on a determination of their net value to policymakers. But determining those net gains can be difficult because it requires finding complementary alternatives, a prospect complicated by the unique barriers such as limitations of land and labor or asset specificity of the joint investment (industrial districts or clusters) and the information asymmetry firms have experienced (Watson 1995). When employers act as sellers of sustainable development, they face ambiguity over the

costs of meeting the buyer's expectations for sustainability, along with questions about unknowable future developments (Brown, Potoski and Van Slyke 2009). Asset specificity and measurability problems are both issues in sustainable development. Infrastructure investment, for instance, may be committed to a specific geographic location in the hope of spurring economic development clusters.

Second, we extend resource dependence theory to policy choices, but not the range of other contractual relationships between local governments. We expect cities to utilize other collaborative mechanisms in part to minimize their resource dependencies on third-parties. Cities have several relevant external options for dealing with financial resource scarcity, including consolidation (mergers) or expansion (annexation), contracting out more services, co-optation (volunteer boards) and forming alliances through economic development partnerships or tax-base sharing (Malatesta and Smith 2014). Perspectives such as the Institutional Collective Action (ICA) framework have explored alternative methods of collaborative action based on the transaction costs employed (Feiock 2013). But collaborative research often treats the resource needs of cities transparently, or as a control variable in models. The selection between these alternatives is in part a function of the importance of the resources of the city, the inability of the city to find the resources elsewhere (monopoly power), the discretion the city possesses (mergers, annexation and partnerships might not be a realistic option), and the visibility of the activity (Pfeffer and Salancik 1977).

Finally, while our merged survey approach reduces problems of reverse causation and endogeneity, it does not completely overcome them. Longitudinal studies are required to fully explore the causal linkages between cities' contractual relationships with firms and their progress toward or retreat from greater states of sustainability. Longitudinal studies would also allow

researchers to take full advantage of the Bayesian statistical approach, since local government bureaucrats and policymakers are learning agents. The Bayesian paradigm is uniquely suited for capturing acquired knowledge within a statistical model through the use of an informed prior distribution. Ideally, Bayesian inference in the near future will allow urban scholars and applied analysts alike to make more informed, accurate predictions of urban policy choices and outcomes.

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Tables and Figures

Table 1 Descriptive Statistics

Variables	Obs.	Mean	Standard Dev.
Inclusion (DV)	419	0.44	0.28
Sustainability (DV)	419	0.24	0.21
Carbon (DV)	419	0.21	0.24
Land Use (DV)	419	0.19	0.18
Energy (DV)	419	0.19	0.13
Small-Business	419	0.22	0.18
Retention	419	0.50	0.27
Incentives	419	0.43	0.21
Accountability	419	0.50	0.36
Community	419	0.31	0.07
Suburb	419	0.66	0.47
Rural	419	0.15	0.36
Suburb*Community	419	0.20	0.15
Suburb*Small Bus.	419	0.12	0.14
Rural*Community	419	0.05	0.11
Rural*Small Bus.	419	0.04	0.11
ICLEI	419	0.10	0.11
Business Part.	419	0.67	0.17
Gov. Part.	419	0.87	0.03
Competition	419	0.76	0.04
Manager	419	0.62	0.49
Mayor	419	0.27	0.45
Age	385	0.10	0.04
Ethnicity	385	0.58	0.19
Population	385	59,150	101,726
Pop. Change	382	7,738	19,599
Decline	419	0.11	0.17
Cost	419	0.05	0.03
Land	419	0.52	0.21
Taxes	419	0.45	0.12

Table 2 Bayesian OLS Regression Models with Metropolis-Hastings Random Walk Sampling

Variables	Model 1 Sustain(full)			Model 2 Land Use			Model 3 Energy			Model 4 Carbon			Model 5 Inclusion		
	Mean	L. CI	U. CI	Mean	L. CI	U. CI	Mean	L. CI	U. CI	Mean	L. CI	U. CI	Mean	L. CI	U. CI
Small-Business	.009	-.027	.045	.009	-.025	.042	.021	-.155	.198	.064	-.12	.249	.006	-.162	.174
Retention	.024	.0003	.048	.011	-.011	.033	.101	-.015	.217	.174	.053	.296	.103	-.007	.215
Incentives	-.047	-.072	-.021	-.024	-.048	-.001	-.135	-.258	-.011	-.18	-.31	-.051	-.12	-.238	-.002
Accountability	.009	-.013	.032	.004	-.017	.025	.061	-.051	.175	-.019	-.136	.097	.042	-.064	.15
Community	.045	.002	.088	.025	-.015	.065	.101	-.107	.31	.113	-.099	.329	.242	.049	.437
Suburb	-.038	-.151	.077	-.044	-.152	.065	-.239	-.809	.329	.066	-.506	.659	-.186	-.714	.348
Rural	.048	-.078	.172	.033	-.084	.148	-.011	-.628	.602	.022	-.609	.659	.041	-.535	.611
Suburb	-.019	-.131	.091	.028	-.078	.134	-.052	-.604	.499	-.266	-.837	.293	-.118	-.631	.387
*Community															
Suburb	.021	-.018	.059	.009	-.026	.046	.142	.049	.332	-.002	-.201	.196	.046	-.133	.227
*Small Bus.															
Rural	-.103	-.224	.021	-.057	-.171	.058	-.21	-.806	.402	-.200	-.823	.421	-.372	-.933	.194
*Community															
Rural	.032	-.006	.07	.003	-.033	.039	.169	-.017	.355	.064	-.129	.258	.232	.055	.409
*Small Bus.															
ICLEI	.016	-.003	.036	.003	-.015	.022	.114	.016	.212	.046	-.054	.148	.036	-.056	.13
Business Part.	.017	-.004	.038	.009	-.011	.03	.037	-.068	.144	.086	-.023	.196	.107	.006	.207
Gov. Part.	.007	-.015	.029	.002	-.019	.023	.001	-.109	.113	-.028	-.144	.085	-.016	-.121	.088
Competition	-.012	-.034	.01	-.022	-.043	-.001	-.011	-.121	.099	-.037	-.152	.078	-.011	-.116	.094
Manager	.015	-.014	.046	.009	-.019	.037	.046	-.102	.194	-.086	-.239	.067	.153	.012	.294
Mayor	-.001	-.031	.029	.0005	-.028	.029	-.046	-.196	.103	-.166	-.321	-.011	.098	-.043	.241
Age	.015	-.004	.035	.012	-.006	.031	-.036	-.135	.061	.066	-.035	.168	.069	-.024	.163
Ethnicity	-.026	-.048	-.005	-.008	-.027	.012	-.068	-.172	.035	-.143	-.251	-.035	-.095	-.194	.003
Population	.041	.019	.061	.019	-.000	.039	.23	.127	.333	.124	.018	.231	.083	-.013	.181
Pop. Change	.005	-.014	.023	.009	-.008	.027	.004	-.088	.097	-.031	-.127	.065	-.093	-.182	-.005
Decline	-.033	-.054	-.011	-.011	-.031	.009	-.125	-.23	-.021	-.138	-.247	-.03	-.094	-.194	.005
Cost	.007	-.014	.029	.003	-.018	.023	-.009	-.116	.099	-.02	-.131	.092	.057	-.045	.159
Land	.014	-.004	.034	.011	-.007	.029	.069	-.025	.164	.03	-.068	.129	-.017	-.108	.072
Taxes	.0003	-.019	.021	.012	-.006	.032	-.048	-.148	.05	-.044	-.147	.058	.023	-.071	.117
MCMC			600,000			600,000			600,000			600,000			600,000
Burn-in			100,000			100,000			100,000			100,000			100,000
Obs.			385			385			385			385			385
Acceptance			.439			.427			.426			.433			.428
Efficiency			.086			.085			.084			.083			.086

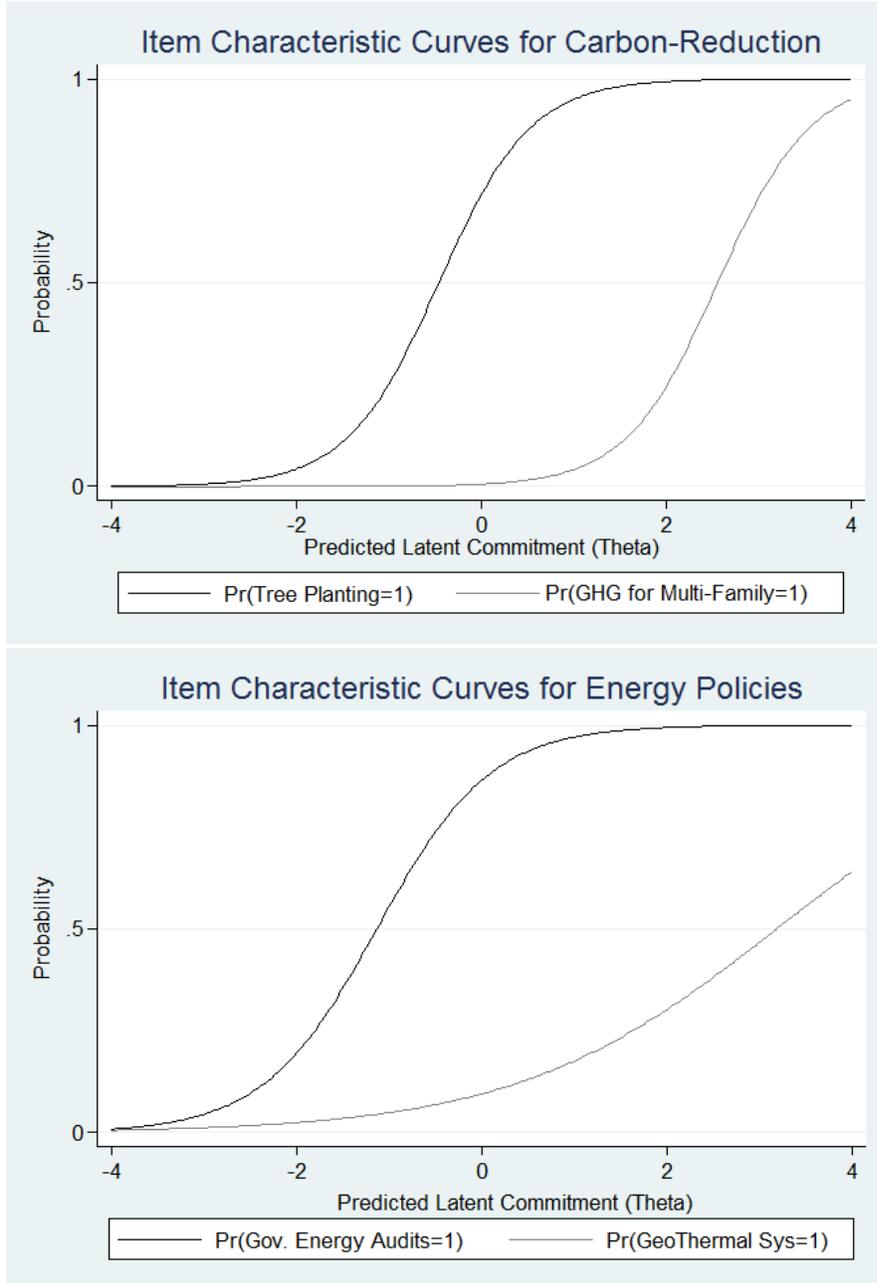


Figure 1: These ICC graphs show the lowest- and highest-difficulty survey items for carbon and energy policies. They demonstrate why greenhouse-gas emissions reduction targets for multi-family housing and installation of geo-thermal HVAC systems installed by cities should have a greater weight in any index of policy actions than more easily implemented actions.

