

The Small Business Sector and Urban Sustainability Policies: Assessing the Relationship

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Background: Because we had largely negative results, we decided not to pursue publication after going through peer review with an urban studies journal and finding that the lack of strong positive results was a main factor for rejection. Instead, we made some improvements in response to reviewers' comments and added the article to mythe web site page on localist research. The paper has some general methodological value because it underscores the importance of controlling for population when studying the effects of the small business sector on social and economic outcomes in cities and counties.

Abstract

The literatures on the benefits of the small-business sector for cities and other local regions and on the factors that influence the development of urban sustainability policies are brought together. A multivariate analysis of 362 metropolitan statistical areas in the U.S. showed that small-business measures were positively associated with the odds of sustainability policy adoption, but when controlling for population most measures were not significant. We suggest that some previous findings about the general benefits of small businesses for cities may not control adequately for population and that future studies should attend to this issue.

Social scientists have long recognized the benefits of a vibrant small-business sector to the livability of a town or city. A vibrant small-business sector can protect a community from the risk of catastrophic job loss that occurs when a large employer closes down, and the literature has suggested that small-business strength is associated with a stronger civil society, more vibrant political culture, lower crime rate, and other desirable features of a city or region (Tolbert et. al 1998, 2002; Tolbert 2005; Lyson and Tolbert 2003). Increasingly, one of the desirable features of a region is its “sustainability” in the sense of environmental quality. Urban sustainability programs include the greening of public transit, new-urbanist and smart-growth approaches to planning and design, pedestrian- and bicycle-oriented transportation, energy-efficiency and renewable energy measures for buildings, recycling and reuse programs, community gardens and local food programs, and the development of green spaces. Cities are developing sustainability programs throughout the world, but the extent of the programs and level of support is highly variable (Bud et al. 2008, Lubell et al. 2009, Vasi 2007, Zahran et al. 2008). Thus, two literatures have emerged that are not yet connected: research on the connection between small businesses and the quality of life of cities, and studies of the politics of urban sustainability and the factors that affect the development of urban greening policies. This research project represents a novel attempt to bring the two literatures together and to assess the potential linkage between the small business community and urban sustainability. We investigate the hypothesis that the strength of a city’s small-business sector is positively related to the strength of its sustainability commitments.

General Background

[This section contains a long literature review that is deleted from the web version of the article.]

Hypotheses

Our research brings together these diverse strands of urban and environmental studies to examine the potential role of the small-business sector in metropolitan sustainability policies

in the U.S. We tested the following hypotheses about the effects of business type on the adoption of sustainability policies:

1. A stronger green-jobs sector and weaker fossil-fuel sector will increase the odds that the leading city in a metro region will adopt a sustainability plan or policy. We introduced this hypothesis based on previous research that indicated that a strong fossil-fuel sector may have a negative relationship with policy adoption. We reasoned that regions with weaker fossil-fuel industries and stronger green industries would be more inclined to adopt sustainability policies.
2. A stronger small-business sector will increase the odds that the leading city in a metro region will adopt a sustainability plan or policy, even when controlling for the green-business strength and other general control variables.

Data

Dependent Variables

We used two dependent variables: membership in ICLEI (2013), formerly the International Council for Local Environmental Initiatives but renamed Local Governments for Sustainability, and signatory to the mayors' Climate Protection Agreement or CPA (Mayors Climate Protection Center 2013). These variables are used in the literature on urban sustainability policies as measures of general support. We reasoned that ICLEI membership represented a higher level of commitment, but the signatory on the Cities for Climate Protection agreement has also been used in the literature (Zahran, Grover, et al. 2008). We assigned each metropolitan statistical area (henceforth MSA, N=362) a value of 1 for ICLEI and 1 for CPA if the largest city in the region had adopted the sustainability measure.

Because our focus was on the connection between the small-business sector and urban sustainability policy commitment, we did not study other possible dependent variables that previous research described above has documented as related to the strength of the small-business community (e.g., poverty, income inequality, unemployment, crime, voter turn-out, and population health).

Independent Variables

We grouped independent variables into two categories. The “small business group” included variables related to the small-business sector strength. Following other studies in the economic sociology literature, we used the number of small enterprises from the County Business Patterns data set for a range of industries, including small manufacturing and small accommodations and food services (U.S. Census 2013). We selected manufacturing because it was used widely in the previous localism literature, and the small accommodation and food services variable was a good counterpart for retail. These variables were absolute numbers, which meant that we found collinearity effects with the total population of the metropolitan region. We also tested a small restaurant variable that we created as a ratio of very small enterprises (under 10 employees) to all restaurants, and this ratio was not closely correlated with population. We also used the “indie city index” from the Civic Economics Studies, for which there was no collinearity with population.

The second category of independent variables had to do with industry type rather than size of enterprise. We used the number of fossil-fuel jobs, employment, number of green jobs, ratio of the two, and a binary variable indicating the presence of absence of an organization affiliated with the Business Alliance for Local Living Economies (BALLE). We refer to this group of variables as “the green-fossil group.” Because the level of green jobs was highly correlated with population, we used only the level of fossil-fuel employment, the ratio of fossil-fuel to green jobs, and the BALLE variable.

Control Variables

We used the following control variables: area (the size of the metropolitan area in square miles), political party (percent voting Republican in the 2008 presidential election), percent college education, median income, and an index that we created of level of state-government support for green-energy policy. We also used various population variables as explained below (population size, population density, population change). These were generally important variables in previous studies, but not all previous studies separated out the effects of population size from other population-related variables. These variables were not highly

correlated with each other. Please refer to Appendix for the name, description, and sources of all variables.

Methods

We analyze the effect of variables from the Indie group and green group on the likelihood of a MSA becoming an ICLEI member and adopting the Climate Protection Agreement. The dichotomous natures of these two dependent variables led us to use logistic regression for our sets of models. We specify out models as follows:

$$\ln\left(\frac{p}{1-p}\right) = \alpha + \beta_1 I_i + \beta_2 G_i + \beta_3 C_i + \epsilon_i$$

where

p is the probability of a MSA joining ICLEI or adopting the CCP mandate

I is a vector of indicators within the independent business group of variables

G is a vector of indicators within the green-fossil group of variables

C is a vector of control variables.

Results

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TABLE 1 about here

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Descriptive statistics are presented in Table 1, and the correlation matrix is presented in Table 2. We found that the level of manufacturing enterprises, small accommodations and food services, and population were highly correlated with each other.

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TABLE 2 about here

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We present in Table 3 the models with respect to the hypotheses. Hypothesis 1 was not confirmed. We found no evidence for a connection between the strength of the green business sector, weakness of the fossil-fuel industry sector, or presence of BALLE networks and the odds

of adopting either type of sustainability policy. We did find a relationship between absolute levels of green jobs and odds of policy adoption, but the correlation between level of green jobs employment with population was .995, so we used only the ratio of fossil-fuel employment to green employment in the final models. The lack of a relationship is interesting, because the state-government policy literature suggests that the strength of the fossil-fuel or polluting industry tends to weaken the adoption of renewable portfolio standards and other environmentally oriented legislation. Fossil-fuel employment may be more heavily located in rural areas, thereby reducing its importance in metropolitan area politics.

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TABLE 3 about here

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With respect to Hypothesis 2, we found that strength of small manufacturing and the strength of small accommodations and food services (A&FS) are associated with increased odds of adopting ICLEI membership, but the effect is only significant when the control variables include population density, population change, and area as shown in the table. The small-business variables become insignificant when population size is introduced as a control, and likewise per capita measures of the small-business variables yield non-significant associations. In models not shown here, we found that if population size is introduced as a control variable (and area and population density are taken out), then the two small-business variables become non-significant, and population size is only significant in one of the four models (climate protection agreement and small manufacturing).

In post-hoc analyses, we tested other small-business variables as independent variables (including small finance and insurance firms and small credit unions) and obtained similar results. We also used sequential regression, a method frequently used in dealing with issues of multicollinearity, as a robustness check and found similar results. When small business variables are independently regressed against population, their unique contributions plus their shared contributions with population showed significant and positive effect, while the unique contribution of population is insignificant (result available on request). Because of the importance of the population variable, we partitioned the data set and ran models not shown

here of the largest 175 cities. In these models the variable restaurant (a ratio of small to larger enterprises and therefore not correlated highly with population) was significantly associated with the odds of adopting the Climate Protection Agreement, even when controlling for population, population change, and the same group of control variables, as well as for the independent variable of the indie city index. The unstandardized coefficient of the restaurant ratio variable is 10.57 with the standard error of 5.22. It is significant at the 0.05 level.

Throughout the models, the control variables of political party (Republican) and education (college-level and above) were, in general, significantly associated with the odds of adopting both types of sustainability policies. Area, population change, population density, income, and the level of state-government support were not significant. This pattern suggests the strong association of the adoption of urban sustainability policies with the Democratic Party and more liberal political constituencies, a finding that is consistent with previous research at both the local and state-government levels.

Discussion

After identifying the collinearity issue in our study, we reviewed previous studies on the effects of small businesses on local quality-of-life and economic vitality. Those studies generally used population-related variables such as percentage of population in an urban area, population change, percent of population that has graduated from high-school or college, and percent of population that is civically engaged. However, the variables generally did not include absolute levels of population size or per capita measures for small business strength, with the exception of Tolbert et al. (2002) and Blanchard et al. (2012). Those studies generally also use a dataset based on counties, whereas we were using MSAs. To determine the potential relevance of our findings for the general literature on small businesses and the economic vitality of communities, we ran 16 models comprised of four models (small manufacturing with and without population, small accommodations and food services with and without population) for each of four additional independent variables (per capita income, inequality, poverty, and unemployment). Again, in cases where the relationship between small businesses and the economic variable is significant, it becomes insignificant when population is introduced as a

control variable. The one exception is small manufacturing and income; when population is introduced as the control variable, the coefficient for small manufacturing switches from positive to negative and remains significant. In other words, when controlling for population, cities with more small manufacturing tend to have lower per capita income (-2.328 beta, 1.083 S.D., $p < .05$).

Conclusion

Our goal was to provide a novel attempt to bring together two subfields of social science research, the effects of small business strength on community vitality and studies of the social conditions of sustainability policy support, but it has remained elusive. Instead, our primary conclusion is that larger cities tend to have greater odds of adopting sustainability policies. We reason that city governments of larger cities may have greater resources to support sustainability planning operations, and the greater land mass may raise issues of sprawl and development that are not as salient in smaller cities. In our sample, larger cities also tend to be more Democratic and to have higher per capita incomes.

Of course, larger cities also have more small businesses. Although we found a positive association between small business strength and adoption of sustainability policies, the association is due mainly to collinearity of small-business strength with population. Still, the positive association with the restaurant variable (ratio of small to larger restaurants) suggests that there may be some significant relationships even when controlling for the population size of the metropolitan region. More generally, the political movement to support locally owned, independent businesses has in some cities also become connected with urban sustainability policies, and the network of businesses and business associations that subscribe to the principles of BALLE has increased since 2000. However, the grassroots efforts have not translated into a powerful aggregate quantitative relationship that can be measured in existing data sets, especially with broad dependent variables such as ICLEI membership or CPA adoption. As the movement matures and new measures of urban sustainability policy become available, the relationship may become amenable to quantitative measurement, and certainly unique surveys could be revealing. However, it is also possible that the mobilizations of small

businesses will be expressed most pointedly in policy reforms directed at government procurement preferences and zoning policies, and those policies may only have an indirect sustainability connection.

Perhaps the most important finding is the methodological precaution that research that measures the effects of small-business strength on various local quality-of-life and economic vitality measures should attend carefully to the collinearity of those variables with population size. We suggest that going forward studies of local small-business strength attend to the importance of population as a control variable.

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Appendix: Definition, description and source of all variables

Variable Category	Description	Source
Dependent Variables		
<i>ICLEI</i>	A binary variable that describes whether or not a MSA is an ICLEI member	Constructed from the ICLEI member list.
<i>CPA</i>	A binary variable that describes whether or not a MSA includes a city whose mayor participates in the Cities for Climate Protection program	Constructed from the list of participating mayors published by the U.S Conference of Mayors' Climate Protection Center.
<i>Income</i>	Measurement of Individual Income	US Census Bureau
<i>Inequality</i>	Measured by the Gini index of family income	US Census Bureau
Independent Variables		
<i>Indie City Index</i>	The index that measures independent retail vitality on the national scale	Civic Economics (2011)
<i>Restaurant</i>	Number of restaurants with less than 10 employees / total number of restaurants	2010 MSA Business Patterns (NAICS). Code 7221
<i>Small Manufacturing</i>	Number of manufacturing firms with less than 20 employees	2010 MSA Business Patterns (NAICS). Code 31--
<i>Small Accommodation and Food Services</i>	Number of accommodations and food services firms with less than 20 employees	2010 MSA Business Patterns (NAICS). Code 72--

<i>Green</i>	Number of green jobs in each MSA	Brookings-Battelle Clean Economy Database
<i>Non-Profits</i>	Number of non-profits organizations in each MSA	Number of employer establishments exempted from federal income tax derived from Geographic Area Series: Economy-Wide Key Statistics: 2007 2007 Economic Census
<i>Fossil</i>	Number of fossil fuel jobs in each MSA	Based on Headwaters Economics' Report "Fossil Fuel Extraction as a County Economic Development Strategy". NAICS Codes : 211,213111,213112,2121,213113
<i>BALLE</i>	A binary variable that describes whether or not a MSA contains a BALLE localist champion	Data derived from BALLE's list of localist champions
<i>Population</i>	MSA's population	Census American Community Survey 2010
<i>Population change Area</i>	MSA's population change from 2000-2010 MSA's size	2010 Census of Population and Housing Bennett, Andrew, and Paul Johnson. Number of General-Purpose Local Governments Per United States Metropolitan Statistical Areas (including both PMSAs and CMSAs) from 2002 Census of Governments. ICPSR27806-v1. Ann Arbor, MI: Inter-university Consortium for Political and Social Research and USA.com (data based on 2010 Census)
<i>College</i>	Percent with bachelor's degree or higher among population over 25	Census American Community Survey 2010

<i>Income</i>	Median household income	Census American Community Survey 2010
<i>Republican</i>	A binary variable that describes whether or not a MSA voted primarily for a Republican presidential candidate in the 08 election	Data collected from electoral-vote.com
<i>State-Government Level</i>	Index of state green energy policies	Compiled from a combination of RPS, SBC, net metering, & other policies

Table 1: Descriptive Statistics, Overall Sample, (Unweighted), 2010

Variables	<i>Min</i>	<i>Mean</i>	<i>Max</i>	<i>SD</i>
<i>Small Business Group</i>				
Small Manufacturing	13	451.5322	13046	998.3806
Small Accom. & Food Services	69	968.7927	19408	1893.47
Indie City Index	28.6	94.96331	147.7	18.57461
<i>Green-Fossil Group</i>				
Fossil	0	848.1485	53868.5	3762.043
Green Jobs/Fossil Fuel Jobs	0	0.466599	38.59565	2.432341
BALLE	0	0.131653	1	0.338587
<i>Control Variables</i>				
Population	55274	667472.4	12828837	1272724
Population density	5.903521	505.0971	32030.7	1872.855
Population change	-11.3	11.37	92	10.81863
Area	4.17	2274.152	39719.1	3236.252
Republican	0	0.501401	1	0.5007
College	11.3	25.38095	57.9	7.898202
Income	20915	48231.99	85799	8319.294
State_Gov_Level	0	3.67479	7.6	2.37477

Table 2. Correlation Matrix of All Variables

	BALLE	AREA	CPA	COLL.	SA&FS	FOSS	ICLEI	INC.	INDIE	JOB_R	MANU	PARTY	POP_C	POP_D	POPU	RESTR	STATE
BALLE	1																
AREA	0.16	1															
CPA	0.19	0.15	1														
COLLEGE	0.35	0.61	0.49	1													
SM A&FS	0.33	0.34	0.31	0.32	1												
FOSSIL	-0.01	0.18	0.01	-0.02	0.22	1											
ICLEI	0.24	0.22	0.47	0.5	0.37	0.04	1										
INCOME	0.29	0.13	0.32	0.59	0.42	0.53	0.39	1									
INDIE	0.08	0.08	0.07	0.02	0.09	0.03	0.07	0.15	1								
JOB_RATIO	-0.05	-0.01	0.15	-0.11	-0.06	0.41	0.12	0	-0.06	1							
MANU	0.30	0.30	0.27	0.26	0.96	0.22	0.32	0.34	0.07	-0.05	1						
PARTY	-0.22	-0.08	0.39	-0.37	-0.22	0.17	0.38	0.29	0.04	0.17	-0.19	1					
POP_CHA	-0.02	0.30	0.07	0.15	0.02	0.10	0	0.1	0.11	0.03	-0.01	0.16	1				
POP_DEN	0.02	-0.08	0.03	-0.01	0.09	0.01	0.01	0.11	0.05	-0.04	0.09	0.04	0.01	1			
POPU	0.29	0.39	0.3	0.28	0.98	0.29	0.36	0.39	0.07	-0.05	0.95	-0.19	0.07	0.08	1		
RESTAUR.	0.13	-0.10	0.11	0.03	0.15	0.10	0.14	0.29	0.21	-0.11	0.10	-0.28	-0.23	0.18	0.08	1	
STATE_GV	0.29	0.11	0.24	0.24	0.18	0.12	0.25	0.43	0.10	-0.13	0.18	-0.43	-0.15	0.09	0.14	0.5	1

Table 3. Logistic Regression Coefficients (standard errors) for Models Predicting the Odds of a MSA joining ICLEI or adopting the CPA

Variables	Dependent variable: ICLEI		Dependent Variable: CPA	
	Model 1	Model 2	Model 3	Model 4
<i>Small Bus.</i>				
Small Manu- facturing	0.00100 * (0.00048)		0.00304 *** (0.00085)	
Small Accom & Food Services		0.00059 * (0.00024)		0.00197 (0.00048)
Indie City Index	0.00047 (0.00767)	-0.00020 (0.00768)	-0.00035 (0.00720)	-0.00112 (0.00730)
<i>Green-Fossil</i>				
Fossil	0.00009 (0.00012)	0.00007 (0.00012)	-0.00006 (0.00011)	-0.00011 (0.00011)
Green/Fossil	-0.47388 (0.40201)	-0.44878 (0.39528)	-0.11057 (0.19671)	-0.06570 (0.19537)
BALLE	-0.06378 (0.45152)	-0.04111 (0.45297)	-0.40999 (0.50249)	-0.31715 (0.52013)
<i>Control Variables</i>				
Population density	0.00001 (0.01678)	0.00000 (0.00009)	-0.00007 (0.00014)	-0.00010 (0.00018)
Population change	-0.02204 (0.01678)	-0.02207 (0.01679)	0.01394 (0.01452)	0.01433 (0.01470)
Area	0.00014 (0.00009)	0.00012 (0.00009)	-0.00002 (0.00005)	-0.00007 (0.00006)
Republican	-0.81742 ** (0.32357)	-0.76744 ** (0.32519)	-1.12261 *** (0.30936)	-1.05308 *** (0.31161)
College	0.11844 ***	0.11640 ***	0.14040 ***	0.13157 ***

		(0.02534)	(0.02532)	(0.02879)	(0.02892)
Income		0.00002	0.00002	-0.00003	-0.00004
		(0.00002)	(0.00002)	(0.00003)	(0.00003)
State_Gov_Level		0.00694	0.01482	0.07486	0.08009
		(0.07347)	(0.07403)	(0.07183)	(0.07322)
Constant		-4.58552 ***	-4.36845 ***	-2.05246 †	-1.70373
		(1.18506)	(1.19627)	(1.13393)	(1.15735)
McFadden R-Sq.	0.315538	0.32205	0.32618	0.32825	0.34590
N		362	362	362	362

Note: Unstandardized coefficients with standard errors in parentheses

† p < 0.1; * p < .05; ** p < .01; *** p < .001 (two-tailed tests)