

Rural Research Report



Fall, 2017
Volume 27, Issue 1

By Adee Athiyaman, Professor
Cynthia Struthers, Assoc Professor
Timothy Collins, Asst. Director
Illinois Institute for Rural Affairs

Editorial Board

Co-Editors

Adee Athiyaman, PhD
Chris Merrett, PhD

Editorial Review Board

Tim Collins, PhD
John Gruidl, PhD
Cynthia Struthers, PhD

Published by Illinois Institute
for Rural Affairs

Stipes Hall 518
Western Illinois University
Macomb, IL 61455-1390
309.298.2237

www.IIRA.org

RESIDENT SATISFACTION WITH PUBLIC SERVICES IN NONMETROPOLITAN ILLINOIS: IMPLICATIONS FOR RESOURCE ALLOCATION

The American Customer Satisfaction Index suggests that citizens are dissatisfied with government services. Since one's commitment to community (resident loyalty) depends on one's evaluation whether it is a good place to live or not, it is essential that communities gauge resident satisfaction with their place of living. This paper constructs a county-level public service satisfaction index for non-metro Illinois. The satisfaction index is then employed to optimize public-service resource allocation. Results suggest that to maximize resident satisfaction, counties should spend 41% of their budgets on education, 12% on public safety, and around 32% on health-related welfare.

1.0 Introduction

This paper deals with residents' satisfaction perceptions about public services in non-metro Illinois, counties with a population of less than 50,000 people. Public service is defined broadly to include both collective consumption and impure public products. An example of collective consumption would be situations where an individual's consumption of the product leads to no subtraction from any other individual's consumption of that product: street lights and public television would be instances of the category (Samuelson, 1954). An example of impure public product would be public school places that are accessible only to some segments of the population because of "zoning" restrictions (Scott and Marshall, 2005). For the purposes of this paper, we assume that public services are either provided wholly by the government, or co-produced with the private sector.

According to the American Customer Satisfaction Index (ACSI), citizen satisfaction with the federal government is well below the private sector. On a 100-point scale, the ACSI for federal government services is 68 (ACSI, 2017). If we assume similar scores for resident satisfaction with public services then there is a possibility that dissatisfied residents could switch their place of residence to another community - see Goudy (1990) for empirical evidence in support of this assertion.

How does a given non-metro county in Illinois fare against other non-metro counties on resident satisfaction with public services? How to incorporate resident satisfaction perceptions about public services in resource allocation models? This paper addresses these and other similar questions.

2.0. Satisfaction and Resource Allocation

2.1 Satisfaction

How would residents evaluate the community that they live in? Based on their beliefs about the community. For instance, Fulton County, IL, which is closer to the city of Peoria could position itself as a bedroom community that offers all the benefits of city living at a lower cost. From a resident's viewpoint if the motive for living in the community (for example, low cost) is attained through benefits experienced in the community (for example, low-cost housing and public transportation), then satisfaction with the community and public services results. Since perception is a salient concept in the explanation we elaborate the concept and demonstrate its direct linkage to the satisfaction construct.

Perceiving or comprehending the meaning of a stimulus involves categorizing the stimulus (Smith 1995). For instance, a road is clean if it resembles our mental representation of the category "clean road". This mental representation of clean road could include features such as: (i) no litter on the road-side (ii) paved evenly (iii) pedestrian crossings marked or painted legibly, and so on. The more features the object shares with our mental representation of "clean road", the more likely we would consider the object a clean road.

Assume that a resident has knowledge of differences among cities in terms of cleanliness of streets. Assume that the resident is fully mobile and is in search for a livable city to reside in and that her decision is based on the single criterion, "cleanliness of the city". Of all the cities that the resident is aware of if city A is perceived as having the cleanest streets then city A is assumed to have the maximum appeal as a place of residence.

The resident who moves to city A based on her perception that it is the cleanest city would start experiencing public services such as streets, law enforcement, and retail shopping. These experiences get stored in the resident's memory as knowledge about the community. In line with the multi-attribute models of satisfaction (see for example, Athiyaman 2015), we posit that the resident's knowledge about service experiences combine additively to result in satisfaction with public services. Expressed as an equation:

Satisfaction with public services = the sum of perceptions about performance of public service i

2.2 Resource Allocation

Although scholars and practitioners advocate an expanded role for citizens in governance, citizens input into local government budget processes are scarce (ICMA 2013). Firsby and Bowman (1996) posit that public perceptions that their opinions are unwanted are hindering citizen participation in government budgetary processes. While methods such as public hearings and direct advisory boards are available to encourage citizen participation in budgetary processes research suggests citizens' surveys to be the most valuable input to the budgetary process (Ebdon (2002); Ebdon and Franklin (2004), and Franklin and Ebdon (2005)).

Consider the following conceptualization that relates satisfaction with public service i (S_i) as a function of expenditure on public service i (P_i) and a random element Z_i :

$$S_i = f_i(P_i, Z_i) \text{ for } i = 1, \dots, n. \quad (1)$$

Denote the total public service budget for the county as P . The county allocates a budget for each public service (for example, law enforcement, welfare, etc.) such that, $\sum_{i=1}^n P_i = 1$; P_i expressed as a proportion of the total.

Our objective is to maximize expected satisfaction subject to budget constraints.

That is:

$$\text{Max. } E(\Sigma S_i)$$

$$\text{St. } \sum_{i=1}^n P_i = 1 \text{ and } 0 < P_i < 1$$

This approach requires only resident satisfaction perceptions to decide on optimal resource allocation for public services. In general, optimizing public-service budget allocations rests on the assumption that the marginal contribution of public service expenditure with respect to satisfaction is the same across all types of public services. Yet in reality the county administrator does not know what satisfaction response will be elicited by allocating a certain portion of the budget to a public-service category. The best management can do is predict satisfaction response to a specific expenditure allocation in terms of a probability distribution. The distribution of error term in a regression study can serve as an estimate of such probabilities provided that the model is correctly specified and the error-terms of satisfaction in various public-service categories are uncorrelated.

Correlations among error terms can occur if satisfaction with one public service is dependent on satisfaction with other public services. For example, satisfaction with law enforcement in a community could depend on satisfaction with, housing and streets.

In such situations, satisfaction-response functions need to be estimated using the seemingly unrelated regression model (Zellner 1962).

So the mathematical form of Eq. 1 is a modified exponential function which captures the diminishing returns to public-service expenditure:

$$E(Z_i) = e^{0.5 \sigma^2(\epsilon_i)}$$

$$S_i = K_i (1 - e^{-C_i P_i})$$

$$\text{for } i = 1, \dots, n$$

(2)

In Eq. 2, $K_i > 0$ is the upper limit of satisfaction since S_i approaches K_i as P_i becomes very large; $C_i > 0$ is the rate at which satisfaction reaches the upper limit in response to increases in public-service

expenditure. To estimate n such equations, we apply logarithmic transformation to Eq. 2 to yield

$$\ln S_i = \ln K_i + \ln(1 - e^{-C_i P_i}) + \epsilon_i$$

$$\text{for } i = 1, \dots, n$$

(3)

Estimating Eq. 3 implies an underlying stochastic satisfaction function of the form

$$S_i = K_i (1 - e^{-C_i P_i}) Z_i$$

$$\text{for } i = 1, \dots, n$$

(4)

where Z_i is defined implicitly by $\epsilon_i = \ln(Z_i)$.

Invoking the assumption that the ϵ_i are independently and identically distributed results in

$$E(S_i) = K_i (1 - e^{-C_i P_i}) E(Z_i)$$

$$\text{for } i = 1, \dots, n$$

(5)

$$\sigma^2(S_i) = K_i^2 (1 - e^{-C_i P_i})^2 \sigma^2(Z_i)$$

$$\text{for } i = 1, \dots, n$$

(6)

where $E(Z_i)$ is the expected value of the random variable Z_i , and $\sigma^2(Z_i)$ is its variance.

In summary, calibrating the system of satisfaction-response functions using seemingly unrelated regressions would provide estimates of K_i , C_i , and the covariance matrix of the residuals ϵ_i .

However, to calibrate Eq. 4 we need the covariance matrix of the Z_i . Since $\epsilon_i = \ln(Z_i)$, the log-normally distributed Z_i could be described as follows (see Morrison 1967):

$$\sigma^2(S_i) = e^{2\sigma^2(\epsilon_i)} - e^{\sigma^2(\epsilon_i)} \quad (7)$$

$$\text{Cov}(Z_i, Z_j) =$$

$$e^{0.5(\sigma^2(\epsilon_i) + \sigma^2(\epsilon_j)) + r_{ij} \sigma(\epsilon_i)\sigma(\epsilon_j)} - e^{0.5(\sigma^2(\epsilon_i) + \sigma^2(\epsilon_j))}$$

$$R_{i,j} = \frac{\text{Cov}(Z_i, Z_j)}{\sigma(Z_i)\sigma(Z_j)} \quad (8)$$

where r_{ij} is the correlation between ϵ_i and ϵ_j ; $\sigma^2(\epsilon_i)$ is the variance of ϵ_i , and $\sigma(\epsilon_i)\sigma(\epsilon_j)$ is $\text{cov}(\epsilon_i, \epsilon_j)$.

Having highlighted the inputs needed to calibrate the resource-allocation model, we

3.0 Data for Analysis

next describe the data used in the analyses.

Measures of public-service satisfaction were obtained from a sample survey of residents in nonmetropolitan Illinois. The Office of Management and Budget groups Illinois into 28 metropolitan counties and 74 nonmetropolitan counties. The target population includes all households in the nonmetropolitan counties. A simple random sampling procedure was employed to select 2,000 households. The mail survey procedure used an alert postcard informing potential respondents that a survey is being conducted and that they will soon be mailed a survey instrument followed by a first mailing of the questionnaire with a cover note requesting cooperation. Then a reminder postcard was sent followed by mailing a second questionnaire to those who did not complete and return the first.

The survey focus is on allocational and developmental variables (Nelson 1999; Peterson 1981). Allocational indicators include essential and often economically neutral services such as police, fire, and sanitation. Developmental services aim to improve the economic position of the community, examples include education and roads.

In research on local governments in Alabama, Baker (2003) identified a set of allocational and developmental variables considered essential for quality living. The list included items such as police, cable television, and public transportation. The relevance of these variables for rural Illinois was assessed by an expert panel of academics affiliated with a publicly funded rural research center. While the expert panel retained most of the items highlighted in Baker's study, the panel recommended including additional items in the questionnaire (see Appendix 1 for a list of the items).

Public service expenditure data were gathered using publications from the Illinois Comptroller's Office. Appendix 2 shows the expenditure data used in the study.

4.0 Results

The questionnaire yielded 640 usable responses from 35 counties. A majority of the respondents were female (53%), aged between 35 and 65 years (55%), with a household income not exceeding \$50,000 (67%) (See Appendix 1 for a summary description of the respondents and their responses).

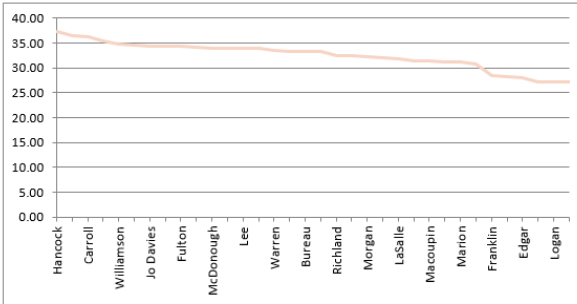
4.1 Satisfaction Index

To construct an overall public-service satisfaction index for the counties average responses to the public service items listed in Appendix 1 were summed. This methodology assumes that satisfaction is an abstract-formed concept: the abstract concept "overall satisfaction with public services" is made up of knowledge about eight different public services listed in Appendix 1. The index scores could range from a high 40 to a low 8.

Figure 1 plots the resident-satisfaction index for the counties. Hancock County has the highest satisfaction index (37.4), and Ford County the least (26.8). The residents of the Cumberland County exhibit median level of satisfaction (33.3). Holzer, Charbonneau, and Kim (2009) contend that the demographic profiles of the counties such as the age of the respondents are associated with citizen evaluation of services. The explanation is that people less than 40 years of age demand more from services such as child care, schooling, etc. and this high expectation differentiates them from the rest of the population. We found no such associations. For example, Hancock County which has the highest satisfaction rating has 51% of its population over 40

years of age (total population of the county is around 19,000). The same figure for Ford County which has the lowest satisfaction score is 50% (total population is ~14, 000). Overall, the correlation between satisfaction scores and population less than 40 years of age is 0.048 ($p > .75$, statistically insignificant)

Figure 1
Resident-Satisfaction Index for the Counties



Note: See Appendix 3 for numerical scores.

4.2 Satisfaction Response Function

A nonlinear seemingly unrelated regression procedure based on the three-stage least squares method of Gallant (1977) was used to estimate the system of eight

equations in the form given in Eq. 3. The coefficient estimates and the residual covariance are shown in Table 1. Gallant (1977) posits that the nonlinear three-stage least squares estimator is consistent, asymptotically normally distributed and more efficient than the nonlinear two-stage least-squares estimator. In spite of this caution should be used in utilizing the standard errors given in Table 1 since the sample size is not large enough to assume a normal distribution for the estimates.

The means, standard deviations and correlation coefficients for the Z_i were constructed using Eq. 8. Table 2 shows the results of this exercise. This information is used to generate the efficient frontier of public-service resource allocation.

Table 1
Parameter Estimates and Covariance Matrix

Public Service	In K_i	C_i
Education	1.29 (.07)	1.132
Housing	1.70 (.06)	8.976
Library Facilities	1.11 (.06)	9.562
Public safety	0.73 (.58)	3.537
Recreation	1.48 (.08)	2.292
Transportation	1.56 (.16)	4.333
Waste Disposal	1.35 (.11)	6.597
Welfare	1.36 (.11)	0.348

Table 2
Parameter Values for the Resource Allocation Model

Parameter	Public Services							
	Education	Housing	Library	Pub. Safety	Rec.	Transp.	Waste	Welfare
C_i	8.69	5.48	8.09	5.21	6.98	5.97	8.31	5.45
K_i	3.38	4.55	3.04	2.08	4.37	4.76	3.86	3.90
$E(Z_i)$	1.01	1.04	1.00	1.01	1.00	1.32	1.08	1.04
σ_{ϵ_i}	0.11	0.28	0.08	0.16	0.13	1.15	0.46	0.31

Matrix of Correlations among Z_i

	Edn.	Housing	Lib.	Pub. Sty	Rec.	Transp.	Waste	Welfare
Edn.	1.00							
Housing	0.23	1.00						
Lib.	0.19	0.21	1.00					
Pub. Sty	0.34	0.02	0.38	1.00				
Rec.	0.39	0.03	0.54	0.29	1.00			
Transp.	0.13	0.23	-0.01	-0.02	-0.02	1.00		
Waste	0.06	0.52	0.07	0.01	0.01	0.33	1.00	
Welfare	-0.21	-0.07	0.13	0.21	0.21	-0.07	0.44	1.00

4.3 Resource Allocation

Maximizing public service satisfaction subject to budgets given in Appendix 2 suggests that the non-metro counties should spend the following proportions of their total expenses on each of the eight services: Education (41%), housing (5%), library services (1%), public-safety (12%), recreation (4%), transportation (1%), waste disposal (5%), and health-related welfare (32%). While the prescription ignores statutory mandates on expenditures it does provide information on “ideal” mix of service-expenditures for the region. At present a typical non-metro county spends majority of its budget on education and only 1% on waste disposal (Appendix 4).

5.0 Discussion

Resource allocation for public services is often accomplished using one or more of the three budgeting frameworks: incremental, performance based, and the community values approach (Franklin and Carberry-George, 1999). Incremental budgeting is a political process that starts with last year’s budget and makes minor changes. It is a bottom-up approach in that budget requests are typically prepared by the department heads based on what was done previously and sent to the senior management for approval. In contrast top-down approach is characteristic of the performance framework and the community values approach. Performance framework allocates resources according to the desired level of activity and the related costs for those services. In community values approach the preferences and values of the community are used as inputs to public-service resource allocation.

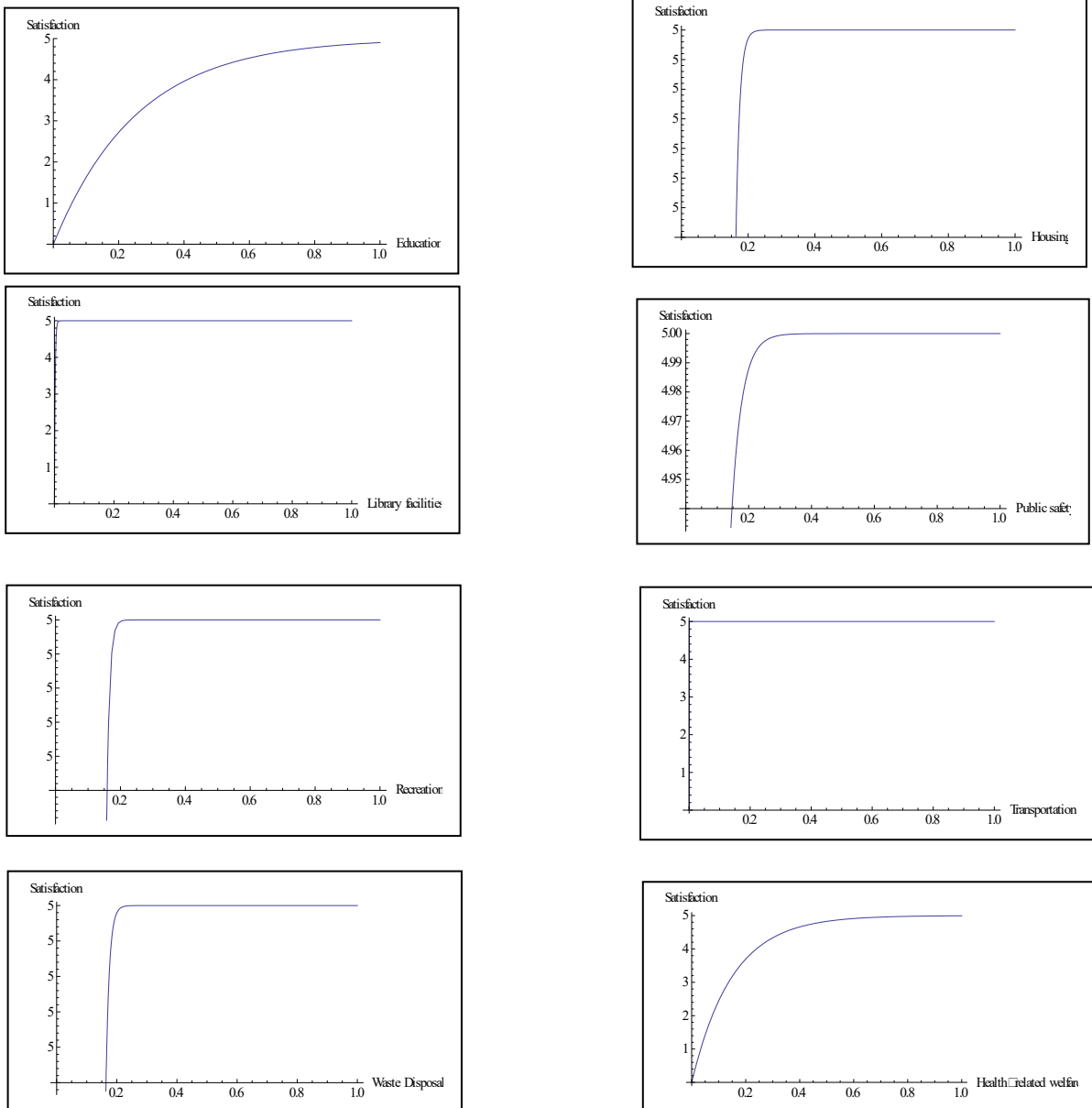
Our research is built on the community values framework. It manages the process using objective data and responds to the fiscal-responsibility demands of the citizens (Van Drehle, 2010). Our normative prescription is that non-metro counties should spend 41% of their total expenses on education, 1% on library services, 12% on public safety, and 32% on citizens’ health-related welfare. Elected decision makers should use the prescriptions as starting point to discuss financial limits for service expenditures. For example, budget discussions could start with a 12% allocation for public safety. Ensuing discussions should consider other facets to budget allocations such as fixed costs of policing and statutory mandates that may stipulate certain minimum standards for law-enforcement and public safety in a community. Table 3 aids this discussion by highlighting the mean amount of satisfaction related to different expenditure scenarios.

The variability in satisfaction (standard deviations) suggests that policy makers wanting a low-risk route to budget allocation would choose a satisfaction objective of 32 index-points. Ideal satisfaction is relatively high risk, its standard deviation is three times more than the safe-bet of 32 satisfaction points (Table 3). Figure 2 summarizes our conclusion that maximum satisfaction is attained when expenditures are apportioned to the eight services as follows: education (41%), housing (5%), library services (1%), public-safety (12%), recreation (4%), transportation (1%), waste disposal (5%), and health-related welfare (32%).

Table 3
Selected Public Service Expenditures and their Impact on Satisfaction

Mean Satisfaction	Std. Dev	Expenditure Item ...							
		Education	Housing	Library	Pub. Safety	Rec.	Transp.	Waste	Welfare
Ideal (Maximum Satisfaction = 38 on a 8 to 40 scale)	4.03	41%	5%	1%	12%	4%	1%	5%	32%
Satisfaction = 33	2.95	74%	10%	1%	10%	3%	1%	1%	1%
Satisfaction = 32	1.22	82%	3%	1%	7%	3%	1%	1%	3%
Satisfaction = 31	3.01	80%	3%	1%	6%	2%	1%	1%	2%
Satisfaction = 30	2.61	50%	2%	1%	5%	1%	1%	1%	41%

Figure 2
Satisfaction Maximizing Expenditure Levels



Empirically, it is shown that Hancock County has the highest satisfaction index and Ford County the least. Could it mean that Ford County would lose its dissatisfied residents? The answer is probably "yes". However, because relocation often takes a long time it is difficult to determine a functional relationship between satisfaction and resident response. A longitudinal-research design that models resident loyalty as a function of public-service satisfaction, and personal variables (for example, monetary significance of the relocating decision) is needed to address the question. This would be an area for future research on the topic.

6.0 Summary and Conclusion

This paper presents an analytical approach to maximizing satisfaction with public services

which could generate resident loyalty or commitment to a community. The mathematical model recognizes the nonlinear effects of public service expenditure on resident satisfaction perceptions and suggests the following spending proportions for eight public services:

- ✓ Education (41%), Housing (5%), Library services (1%), Public-safety (12%), Recreation (4%), Transportation (1%), Waste disposal (5%), and Health-related welfare (32%).

These are the spending required to attain maximum satisfaction levels. Exceeding these levels will not increase satisfaction. The "manage-by-fact" approach presented in this paper could help local governments to assure their citizens that their opinions and evaluations drive public-service resource-allocation process in the community.

Appendix 1 Descriptive Statistics

Respondents Characteristics

Gender	%
Male	47
Female	53

Marital Status	%
Married	56
Single (never married)	9
Widowed	17
Divorced or separated	19

Ethnic Group	%
White	97
Black	1
Other	2

Formal Education	%
Less than 9 th grade	3
9 th to 12 th grade	7
High school diploma	29
Some college	25
Associate degree	10
Bachelors degree	16
Graduate degree	10

Household Income	%
Less than \$20,000	24
\$20,000 to \$39,999	31
\$40,000 to \$59,999	21
\$60,000 to \$79,999	13
\$80,000 to \$100,000	6
More than \$100,000	5

Responses (Community Service Variables)

	Mean	Std. Dev
x ₁ : Education (K-12)	4.1	1.5
x ₂ : Housing	3.9	1.3
x ₃ : Library services	4.3	1.2
x ₄ : Public safety	3.7	1.3
x ₅ : Parks and recreation	4.0	1.3
x ₆ : Public transit and transportation	4.5	2.3
x ₇ : Waste disposal	4.0	1.4
X ₈ : Health-related welfare	3.9	1.6

Appendix 1 Cont'd ...

County-wise Responses

County	No. of Respondents
Bureau	4%
Carroll	2%
Christian	2%
Clay	2%
Coles	2%
Cumberland	2%
Douglas	2%
Edgar	1%
Effingham	2%
Ford	1%
Franklin	2%
Fulton	2%
Hancock	1%
Iroquois	2%
Jackson	4%
Jefferson	3%
Jo Davies	2%
Knox	6%
LaSalle	8%
Lee	4%
Logan	2%
McDonough	3%
Macoupin	7%
Marion	4%
Mason	1%
Morgan	3%
Randolph	2%
Richland	2%
Saline	2%
Stephenson	4%
Vermillion	6%
Warren	2%
Wayne	1%
Whiteside	5%
Williamson	3%
Total	100% (n=640)

Appendix 2
Per Capita Expenditure Data (\$ in 2015)

County	Edu.	Lib	Health	Trans.	Police	Parks	Housing	Waste
Bureau	1277.74	14.32	669.22	0.05	127.89	41	49.98	52
Carroll	1353.17	23.08	14.96	3.24	130.46	55.98	46.89	23.44
Christian	1151.38	7.78	23.43	2.41	118.22	78.86	34.3	12.78
Clay	1480.2	10.35	795.56	22.18	93.33	20.57	68.35	34.7
Coles	2374.6	33.48	65.39	18.76	150.57	84.38	21.79	4.47
Cumberland	1325.56	6.31	42.97	0.05	103.59	52.16	45.22	0.81
Douglas	1262.98	21.75	23.11	0.05	119.94	25.96	0.05	0.05
Edgar	1382.98	6.39	72.41	0.05	105.84	11.02	103.78	0.05
Effingham	1189.86	0.73	55.88	4.16	129.08	51	45.68	6.22
Ford	1192.77	22.6	18.15	0.05	162.34	40.25	165.02	3.74
Franklin	1186.22	37.98	17.87	7.73	151.24	19.28	112.29	21.64
Fulton	1670.73	11.62	107.36	0.05	115.9	111.01	52.21	17.39
Hancock	1322.36	26.86	65.1	0.05	77.14	23.46	16.35	0.05
Iroquois	1408.18	64.55	61.79	0.05	87.26	28.33	0.81	36.05
Jackson	1507.31	18.8	89.15	53.07	148	54.7	46.26	20.24
Jefferson	1903.77	12.58	24.75	58.03	130.83	17.99	123.8	14.59
Jo Davies	1449.11	14.48	306.02	0.05	117.78	247.94	183.53	19.6
Knox	1216.66	74.21	23.76	4.95	154.92	54.66	102.94	46.32
LaSalle	1637.61	20.01	32.82	2.15	147.4	21.39	67.71	21.26
Lee	1659.26	17.4	38.59	2.81	120.19	34.16	24.08	14.6
Logan	942.07	24.39	73.19	0.97	142.39	48.77	39.49	1.66
McDonough	891.75	13.75	1263.06	18.63	94.01	49.51	83.81	22.22
Macoupin	1420.1	72.12	42.24	0.05	106.15	41.39	30.51	0.41
Marion	1841.54	16.8	635.54	2.75	123.46	18.89	50.6	41.45
Mason	1553.41	33.4	751.47	0.44	97.19	65.29	21.45	8.94
Morgan	1029.71	17.31	39.71	9.03	123.59	38.91	25.7	0.14
Randolph	1069.19	29.7	869.34	7.75	110.66	20.09	35.41	3.09
Richland	3599.23	11.95	13.26	15.25	80.53	40.45	72.38	16.3
Saline	2205.7	18.55	0.04	6.67	166.16	23.81	77.44	0.05
Stephenson	1467.93	59.54	44.96	3.07	134.85	107.09	26.66	51.66
Vermillion	1651.3	35.6	42.56	8.74	156.16	26.38	78.16	21.22
Warren	1019.19	25.33	15.11	0.05	109.38	33.6	67.74	0.05
Wayne	1223.25	43.08	35.21	10.62	81.34	16.55	32.98	32.92
Whiteside	1287.15	16.39	1186.7	3.31	103.78	100.43	55.38	22.25
Williamson	1495.6	47.71	20.51	19.18	107.35	22.48	85.16	19.52

Source: Finances of Individual County Governments: Illinois

Appendix 3
Satisfaction Index for Counties

County	Satisfaction Score
Hancock	37.4
Iroquois	36.5
Carroll	36.28571429
Knox	35.375
Williamson	34.8
Whiteside	34.5
Jo Davies	34.44444444
Effingham	34.42857143
Fulton	34.33333333
Stephenson	34.11764706
McDonough	34
Jefferson	33.91666667
Lee	33.875
Christian	33.85714286
Warren	33.5
Mason	33.4
Bureau	33.35714286
Cumberland	33.33333333
Richland	32.5
Wayne	32.4
Morgan	32.2
Coles	32
LaSalle	31.78125
Vermillion	31.41666667
Macoupin	31.30769231
Douglas	31.28571429
Marion	31.11764706
Jackson	30.78571429
Franklin	28.42857143
Saline	28.28571429
Edgar	28
Clay	27.16666667
Logan	27.16666667
Randolph	27.125
Ford	26.8

Note: The index has a score of 40 as its maximum and 8 as the minimum.

Appendix 4
Actual Spending Proportions: 2015

County	Edu.	Lib	Health	Trans.	Police	Parks	Housing	Waste
Bureau	57%	1%	30%	0%	6%	2%	2%	2%
Carroll	82%	1%	1%	0%	8%	3%	3%	1%
Christian	81%	1%	2%	0%	8%	6%	2%	1%
Clay	59%	0%	32%	1%	4%	1%	3%	1%
Coles	86%	1%	2%	1%	5%	3%	1%	0%
Cumberland	84%	0%	3%	0%	7%	3%	3%	0%
Douglas	87%	1%	2%	0%	8%	2%	0%	0%
Edgar	82%	0%	4%	0%	6%	1%	6%	0%
Effingham	80%	0%	4%	0%	9%	3%	3%	0%
Ford	74%	1%	1%	0%	10%	3%	10%	0%
Franklin	76%	2%	1%	0%	10%	1%	7%	1%
Fulton	80%	1%	5%	0%	6%	5%	3%	1%
Hancock	86%	2%	4%	0%	5%	2%	1%	0%
Iroquois	83%	4%	4%	0%	5%	2%	0%	2%
Jackson	78%	1%	5%	3%	8%	3%	2%	1%
Jefferson	83%	1%	1%	3%	6%	1%	5%	1%
Jo Davies	62%	1%	13%	0%	5%	11%	8%	1%
Knox	72%	4%	1%	0%	9%	3%	6%	3%
LaSalle	84%	1%	2%	0%	8%	1%	3%	1%
Lee	87%	1%	2%	0%	6%	2%	1%	1%
Logan	74%	2%	6%	0%	11%	4%	3%	0%
McDonough	37%	1%	52%	1%	4%	2%	3%	1%
Macoupin	83%	4%	2%	0%	6%	2%	2%	0%
Marion	67%	1%	23%	0%	5%	1%	2%	2%
Mason	61%	1%	30%	0%	4%	3%	1%	0%
Morgan	80%	1%	3%	1%	10%	3%	2%	0%
Randolph	50%	1%	41%	0%	5%	1%	2%	0%
Richland	94%	0%	0%	0%	2%	1%	2%	0%
Saline	88%	1%	0%	0%	7%	1%	3%	0%
Stephenson	77%	3%	2%	0%	7%	6%	1%	3%
Vermillion	82%	2%	2%	0%	8%	1%	4%	1%
Warren	80%	2%	1%	0%	9%	3%	5%	0%
Wayne	83%	3%	2%	1%	6%	1%	2%	2%
Whiteside	46%	1%	43%	0%	4%	4%	2%	1%
Williamson	82%	3%	1%	1%	6%	1%	5%	1%
Median	80%	1%	2%	0%	6%	2%	3%	1%

REFERENCES

- ACSI (2017). ACSI Federal Government Report 2016. WWW.TheACSI.Org
- Athiyaman, A. (2015). Market Potential for Residential Biomass Heating Equipment: Stochastic and Econometric Assessments, *International Journal of Sustainable Economies Management*, 4(3), 1-15.
- Baker, William E. (2003), "Defining Quality of Life in Alabama: A Perceptual Community Based Definition for Local Leaders," *International Journal of Public Administration*, 26(7), 733-751.
- Ebdon, Carol (2002), "Beyond the Public Hearing: Citizen Participation in the Local Government Budget Process," *Journal of Public Budgeting, Accounting and Financial Management*, 14(2), 273-294.
- Ebdon, Carol and Aimee Franklin (2004), "Searching for a Role for Citizens in the Budget Process," *Public Budgeting & Finance*, Spring, 32-49.
- Franklin, Aimee L. and Brandi Carberry-George (1999), "Analyzing How Local Governments Establish Service Priorities," *Public Budgeting & Finance*, Fall, 31-46.
- Franklin, Aimee L. and Carol Ebdon (2005), "Are We All Touching the Same Camel?" *The American Review of Public Administration*, 35(2), 168-185.
- Gallant, A. Ronald (1977), "Three-stage Least Squares Estimation for a System of Simultaneous, Nonlinear, Implicit Equations," *Journal of Econometrics*, 5(June), 71-88.
- Goudy, Willis J. (1990), "Community Attachment in a Rural Region," *Rural Sociology*, 55, 178-98.
- Holzer, Marc, Etienne Charbonneau and Younhee Kim (2009), "Mapping the Terrain of Public Service Quality Improvement: Twenty-five Years of Trends and Practices in the United States," *International Review of Administrative Sciences*, 75(3), 403-418.
- ICMA (2013), *Fiscal Distress: Prescriptions for Good Management in Bad Times*, Washington, DC: International City/County Management Association.
- Morrison, Donald (1967), *Multivariate Statistical Methods*, New York: McGraw Hill.
- Nelson, Peter B. (1999), "Quality of Life, Nontraditional Income and Economic Growth: New Development Opportunities from Rural West," *Rural Development Perspectives*, 14(2), 32-37.
- Peterson, Paul E. (1981), *City Limits*, Chicago: University of Chicago Press.
- Samuelson, Paul (1954), "The Pure Theory of Public Expenditure," *Review of Economics and Statistics*, 36(4), Nov., 387-389.
- Scott, John. and Gordon Marshall (2005), *A Dictionary of Sociology*, Oxford: Oxford University Press.
- Smith, Edward E. (1995), *Concepts and Categorization*, In E. E. Smith and D. N. Osherson, eds., *Thinking*, Volume 3, Cambridge, MA: MIT Press.

Van Drehle (2010), "The Other Financial Crisis," *Times*, June 28, 22-28.

Zellner, Arnold (1962), "An Efficient Method of Estimating Seemingly Unrelated Regressions and Tests for Aggregation Bias," *Journal of the American Statistical Association*, 57(June), 348-368.

The Rural Research Report is a series published by the Illinois Institute for Rural Affairs to provide brief updates on innovative best practices and applied research on rural issues. Rural Research Reports are peer-reviewed and are made available to elected officials, public libraries, the general public, and other rural development stakeholders.



WESTERN
ILLINOIS
UNIVERSITY