Tourism Density and Recycling Rates: The Effect of Local Economy Composition On Recycling Outcomes[†]

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This paper examines the potential relationship between tourism and recycling rates by analyzing county-level panel data from Florida counties covering the period from 2001-2016. We propose a Community Waste Management Model (CWMM) that attempts to explain and predict how the recycling behavior of individuals and firms affect community recycling outcomes. This paper proposes three hypotheses: (1) An increase in tourism density will, holding all else equal, cause a reduction in the commercial recycling rate; (2) An increase in tourism density will, holding all else equal, decrease the community recycling rate; (3) An increase in tourism density will, holding all else equal, cause a reduction in the effect of pro-environmental policies. Fixed effects models are used to estimate the impact of a tourism indicator on commercial and residential recycling rates. Results of this empirical analysis provide strong support for Hypotheses One and Two while failing to support the Hypothesis Three. These results provide preliminary support for the use of the CWMM proposed as a tool for predicting recycling behavior and informing policy.

This paper examines the potential relationship between tourism density and recycling outcomes by analyzing county-level panel data from Florida covering the period from 2001-2016. Recycling programs and goals have been increasingly adopted across the country as policymakers aim to manage their land and resources more efficiently. The recycling rate, or what percentage of municipal solid waste is being recycled, is an important measure of efficacy for recycling programs. Therefore, understanding the determinants of recycling rates is an important step in drafting policies aimed at increasing recycling participation. This paper aims to establish a new Community Waste Management Model (CWMM) for predicting the recycling behavior of communities based on the behavior of firms and individuals. This model could be used to help inform the drafting of pro-environmental policy by establishing a framework for understanding the behavioral drivers of different actors in a community.

To test this model, we examine the effect of increased tourism, an industry with a unique incentive structure relative to other industries, on recycling behavior. This paper proposes three hypotheses. First, an increase in tourism density will, holding all else equal, cause a reduction in the commercial recycling rate of a given county. This is reasoned from the concept that accommodation establishments are more dependent on consumer compliance for their recycling behavior. Additionally, consumer compliance among tourists is likely to be lower than average individuals due to changes in their recycling determinants such as higher opportunity costs, less knowledge,

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and fewer social pressures. Second, an increase in tourism density will, holding all else equal, decrease the community recycling rate in a given county. This is based on the assumption that because resident's recycling behavior will be unaffected by tourism, the negative relationship between tourism and commercial recycling rates will lead to a decrease in community recycling rates. Third, an increase in tourism density will, holding all else equal, cause a reduction in the effectiveness of pro-environmental policies. This is based on a similar set of assumptions. If tourists have a negative effect on the recycling behavior of accommodation establishments, then areas with higher tourism density will experience less effect from the policy compared to areas with lower tourism density.

Florida counties were chosen as a case study due to the high volume of tourism to the state and the availability of recycling data. The Florida Department of Environmental Protection has consistently produced annual solid waste reports since 1999, giving Florida some of the most plentiful and detailed statewide recycling data in the country. Florida also implemented a 75% Statewide Recycling Goal in 2010, which gives us a recycling policy to examine in relationship to tourism.

Regressions using fixed effects and interactions are used to find the effect of tourism on recycling rates across different generators and policy periods. Each county and year have two observations, one with the recycling rate of residential waste generators and one with the recycling rate of commercial waste generators. We then interact the tourism variable, as well as other covariates, on the generator type and policy period. This allows us to find the differential effect of tourism density on residential and commercial recycling rates and the effect of tourism density on the efficacy of the policy. We also use a simplified model which directly tests the effects on recycling rates for each generator type independently which allows for a clearer presentation of results. This is used as a robustness check for the more complex specifications.

Empirical evidence from these analyses supports the first hypothesis and second hypothesis proposed. A one unit increase in tourism in the pre-policy period reduced the recycling rate of commercial units by approximately 0.7 to 1.2 points. There are no significant effects of tourism on residential rates, so this negative and significant effect of tourism on commercial units lowers the recycling rates of the entire community in the pre-policy period. The evidence does not support the third hypothesis. It appears that a strong environmental policy, such as the Florida Statewide Recycling Goal, reduces the negative effect tourism has on commercial recycling rates and may flip the effect so that increases in tourism actually result in increases in commercial recycling rates, though the final results were ambiguous. What is clear is that the policy was not made more inefficient by the increase in tourism. This is likely the result of the policy effectively changing the net benefits of establishing and maintaining a recycling program for accommodation establishments. These results provide preliminary support for the use of the CWMM as a viable model for predicting the recycling behavior of communities.

II. Literature Review

The following sections are a guide through the literature on the determinants of recycling outcomes and the marginal contribution of this paper. First, we examine the determinants of individual recycling behavior with a focus on the theory of planned behavior (TPB) as proposed by Ajzen in 1985 as well as the differences in recycling behavior between tourists and residents. Next, we examine the determinants of commercial recycling behavior. Finally, we outline the marginal contributions of this paper and propose a CWMM, composed of new individual and

commercial waste management models, based on findings from the literature. From this model, we produce the research hypotheses.

2.1 Determinants of Individual Recycling Behavior

Theory of Planned Behavior

TPB is a social psychological model extended from the Theory of Reasoned Action (Fishbein & Ajzen, 1975). The theory suggests behavior (B) is the direct result of one's intention to perform an action (BI), and that these intentions are the result three factors: attitude (A), subjective norms (SN), and perceived behavior control (PBC) (Equation 1). These factors are themselves determined by other variables such as knowledge and opportunity cost (Tonglet *et al.*, 2004). There is strong empirical evidence for the validity of TPB as an explanation for behaviors (Ajzen & Fishbein, 1980). There is also broad support in the literature for using TPB as a framework for understanding household recycling outcomes and producing integrated models of waste management behavior (Taylor & Todd, 1995; Chu & Chui, 2003). For the purposes of this paper, we use TPB and previous integrated models of waste management behavior as a starting point for our model of individual recycling behavior with an aim to bring the model into an economic framework. In order to do this, we examine the first and second level factors that determine behavioral intent and any empirical evidence tying these factors to recycling behavior.

$$B \cong BI \cong w_1 A + w_2 SN + w_3 PBC \tag{1}$$

Attitudes and Subjective Norms

There is significant evidence that the pro-environmental attitudes and social norms of individuals positively relates to their recycling behavior. Attitudes here are defined as internal drivers of behavior or a belief that doing an action will result in something positive. Subjective norms are external drivers of behavior or whether or not performing an action will result in the approval a third party. Several studies have pointed to strong relationships between internal drivers, such as pro-environmental attitudes, and recycling behavior as predicted by TPB (Vining & Ebreo, 1992; Howenstein, 1993; Viscusi *et al.*, 2011; Halvorsen, 2008; Shultz *et al.*, 1995). Other studies have made a solid case for the idea that subjective norms in the community drive recycling behavior also in line with the TPB assumptions (Hornik *et al*., 1995; Halvorsen 2008).

Perceived Behavioral Control (Opportunity Cost and Knowledge)

There is substantial evidence that perceived behavioral control affects individuals recycling behavior. Perceived behavioral control is the individual's perception of their ability to perform a task. This is highly associated with both convenience and knowledge about the task. From this definition we can begin tying the theory into an economic perspective, in particular through the concept of opportunity costs. Easy access to recycling facilities and low opportunity cost for participating in recycling has been shown to be one of the strongest determinants of recycling behavior (Derksen & Gartell, 1993; Tonglet *et al.*, 2004; Ando & Gosselin, 2005; Halvorsen, 2008;). Additionally, recyclers, on average are better informed about local recycling programs and sources of recycling information than non-recyclers (Vining & Ebreo 1990; Shultz *et al.*, 1995). Hornick *et al.* (1995) also find knowledge to be among the most significant factors in predicting recycling behavior.

Other Variables

Economic motivations for recycling have been shown to significantly impact recycling outcomes throughout the literature. Significant positive relationships have been found between the availability of economic incentives, such as bottle bills, and recycling behavior (Sidiqe *et al.*, 2009; Viscusi *et al.*, 2011; Grazhdani, 2015). Other studies have shown that converting non-recyclers to recyclers is best done through monetary incentives rather than social norms (Vining & Ebreo 1990; Halvorson, 2008). While there are no economic incentives in our sample, this is still important for the development of our model.

Other demographic variables that we might expect to play a part in recycling behavior do not have solid evidence in the literature. A meta-analysis by Shultz *et al.* (1995) found that age, education, and ethnicity all had unclear effects on recycling behavior. Gender was found to correlate with recycling, as women were more likely to recycle than men, and income was found to have a positive relationship with recycling behavior according to this analysis.

Vacationing and Recycling Determinants

Evidence suggests that vacationing negatively impacts the factors associated with recycling behaviors through reducing attitude and social norm effects, increasing opportunity costs, and reducing information. This part of the literature is not as developed as the determinants for general recycling behavior, but the conclusions are consistent. Individuals tend to experience more barriers and less motivation to act pro-environmentally on vacation than at home (Whitmarsh *et al.*, 2018). Due to these shifts in their behavioral determinants, there are significant differences between levels of pro-environmental behavior at home and on vacation (Dolcinar & Leisch, 2007; Oliver & Benjamin, 2016).

2.2 Determinants of Commercial Recycling Behavior

The literature on the determinants of commercial recycling behavior is less detailed than that of individuals. This is perhaps unsurprising, considering that one would expect commercial entities to make decisions about recycling programs in the context of cost-benefit analyses and market conditions. Indeed, there is evidence that public and regulatory pressure, monitoring of buyers, and availability of resources for implementing policies all drive companies to adopt environmental policies (Lee & Klassen, 2008). However, there are several external factors that can also influence the behavior of corporations. One of these factors is company size, likely a result of economies of scale (Min & Galle, 2001; Basaran, 2013). Another factor that positively affects commercial recycling behavior is internal championing by management (Lee & Klassen, 2008; Basaran, 2013).

2.3 Marginal Contribution, Community Waste Management Model

Previous papers on recycling behavior focus on the level of the individual and the factors that influence an individual's decisions. What this paper aims to provide is a wider scope by looking at aggregate, county-level data over time. With this data, we can estimate the impact of these individual-level behavioral factors on community outcomes, and we can estimate how the behavior of firms plays into community outcomes. To make this analysis, we propose a Community Waste Management Model that takes into account both individual and commercial recycling behavior. Individual recycling behavior will be represented by a modified theory of

planned behavior model. This will include variables for attitudes and subjective norms as in the original model, but splits perceived behavioral control into opportunity cost and knowledge. We also incorporate economic incentives. We make these changes to clarify the different effects of each factor and bring the TPB into an economic context. Each of these factors is weighted uniquely and it is assumed that these weights are unique to each individual. Recycling behavior (RB_i) is the probability that a person will choose to recycle in a given situation. Stated formally, the individual waste management model for a given individual is represented by:

$$RB_i = w_{1,i}Attitudes_i + w_{2,i}SubjectiveNorms_i + w_{3,i}OpportunityCost_i + w_{4,i}Knowledge_i + w_{5,i}EconomicIncentives_i + \varepsilon_i \quad (2)$$

Commercial recycling behavior will be modeled as a function of several important factors. Based on the literature, we will consider commercial recycling behavior a function of the net benefits of implementing and maintaining a recycling program and compliance on behalf of employees and consumers. The net benefits are expected to vary with the size of the firm, due to economies of scale, as well as industry and location. Compliance with recycling programs from employees is assumed to be the total of all the individual recycling behaviors of employees determined by their individual waste management models (Equation 4). While the individual factor values (such as opportunity cost) may change for an individual while interacting with their employer, we do not expect their weights to change. The same logic applies for compliance of consumers (Equation 5). As in the individual waste management model, each factor is given a unique weight and these weights are assumed to vary by firm. Recycling behavior (RB_f) is the probability that a firm will choose to recycle in a given situation. Stated formally, the commercial waste management model for a given firm is represented by:

$$RB_f = w_{1,f}NetBenefits_f + w_{2,f}EmployeeCompliance_f + w_{3,f}ConsumerCompliance_f + \varepsilon_f \quad (3)$$

Where

$$EmployeeCompliance_f = \sum_{employee=1}^{Total\ Employees} RB_{employee} \quad (4)$$

and

$$ConsumerCompliance_f = \sum_{consumer=1}^{Total\ Consumers} RB_{consumer} \quad (5)$$

By combining the individual waste management model and the commercial waste management model, we produce the Community Waste Management Model. This model represents the recycling rate of a given community in a given period of time (t) given the behavioral determinants of all individuals and firms in the community. The average recycling behavior of an individual or firm over a period of time, multiplied by the total waste (x) produced by the person or firm gives the amount recycled over the time period for that individual or firm. We can then sum the amount recycled by all individuals to find the total amount recycled by residents of a community. We go through the same process with firms, adding together the amount recycled of all firms to find the total amount recycled by commercial units. We add together the total amount recycled by residents and commercial units and divide the sum by the total waste produced by residents and units to find the recycling rate for the community. Using this model, we can predict

the recycling behavior of a community from behavioral conditions of individuals and firms. Stated formally, the CWMM is given by:

$$RB_{community,t} = \frac{\sum_{i=1}^{i=N} x_{i,t}(\overline{RB}_{i,t}) + \sum_{f=1}^{f=N} x_{f,t}(\overline{RB}_{f,t})}{\sum_{i=1}^{i=N} x_{i,t} + \sum_{f=1}^{f=N} x_{f,t}} \quad (6)$$

$$RB_{community,t} = \frac{(Amount\ Recycled\ by\ Individuals) + (Amount\ Recycled\ by\ Firms)}{(Total\ Waste\ of\ Individuals) + (Total\ Waste\ of\ Firms)} \quad (7)$$

Using this model, we are able to explain and predict how unique industries with specific average recycling behaviors may affect the overall recycling outcomes of a community. This allows for more precise targeting of policy towards addressing the determinants of less than optimal recycling behavior.

2.4 Hypotheses

From the CWMM, we propose three hypotheses.

Hypothesis 1: An increase in tourism density will, holding all else equal, cause a reduction in the commercial recycling rate.

The recycling behavior of establishments that rely on tourism, particularly accommodation establishments, are more heavily dependent on the consumer compliance – the value of their $w_{4,f}$ coefficient is higher than that of other types of firms. This is because these accommodation establishments rely on their consumers to find and use the proper waste disposal systems in order to maximize the utility of their green programs. Simultaneously, these consumers, namely tourists, have lower recycling behavior values than average individuals. From the literature, we expect tourists to face higher opportunity costs, lower knowledge of recycling systems, and fewer subjective norm pressures than non-traveling individuals. The combination of a reduced value for consumer compliance and a higher weight on this term, leads us to the prediction that when the accommodation establishment make up a higher percentage of commercial units, the commercial recycling rate will be reduced.

Hypothesis 2: An increase in tourism density will, holding all else equal, decrease the community recycling rate.

The recycling behavior of individuals modelled here does not have any mechanism for how tourism specifically would affect the recycling behavior of resident. When we look at the effect of tourism on residential recycling rates we should see small and insignificant effects. Therefore, if there is a negative effect of tourism on commercial recycling rates, then an increase in tourism should also have a negative impact on community recycling rates as a whole.

Hypothesis 3: An increase in tourism density will, holding all else equal, cause a reduction in the effect of pro-environmental policies.

As stated above, we expect increases in tourism density to reduce the recycling rates of commercial units and, therefore, communities. When pro-environmental policies are introduced, we expect to see a drag on the effectiveness of policies caused by tourist recycling behaviors.

III. Methods

To test these hypotheses, this study uses three sets of fixed effect models that take advantage of interactions to find determine the effects of tourism on recycling rates. In the first set of tests, we isolate the first and second hypotheses and aim to estimate the effect of tourism on commercial versus residential recycling rates. For each county in each year, we gather two observations of recycling rates for each generator type, a recycling rate for commercial units and a recycling rate for residential units. All other variables are the same for each pair of observations. We then regress recycling rates on our tourism indicator while interacting tourism on generator type. In this same model we would include fixed effects for county and years to control for county- and time-specific effects. We also include control variables as well as the interactions of these control variables with the generator type variable. The basic form of this model is shown in Equation 8.

$$RR_{ct} = \alpha + \beta Tourism_{ct} + \delta Generator_{ct} + \gamma Tourism_{ct} \times Generator_{ct} + \Gamma X_{ct} + \nu_c + \tau_t + \epsilon_{ct} \quad (8)$$

RR_{ct} denotes the recycling rate of a county c in year t. 'Generator' is a variable that equals one if the recycling rate is from a commercial unit and zero if the recycling rate is from a residential unit. This means that δ represents the difference between commercial and residential recycling rates when tourism equals zero. The interaction term γ represents the difference in the effect of tourism between generator types. β represents the effect of an increase in tourism on residential recycling rates. In this specification, ν_c represents county fixed effects and τ_t represents year fixed effects. Finally, the term X_{ct} represents a vector containing control variables and their interactions with the generator types and the term Γ represents the coefficients for these variables. This model specification allows us to directly observe the effect of tourism on different generator types and determine if there are differential effects between these two generator types. For example, if tourism increases in a county does it affect the recycling rates of residents and commercial units with similar magnitude and direction, or does this effect differ. This will allow us to estimate both the effect on commercial units and to calculate the direction of net effects on community recycling rates.

To test the third hypothesis, we expand on the previous model by adding an interaction between tourism and a policy variable and a triple interaction between tourism, generator type, and the policy variable. The policy variable is defined by the years before and after the implementation of Florida's Statewide Recycling Goal, a pro-environmental policy implemented to increase recycling rates across the country. We also interact the generator variable with this policy variable. We will continue to control for county and year fixed effects as well as a set of covariates. As with the tourism variable, we will add interaction terms between the control variables and the policy variable as well as triple interactions between the controls, generator type, and the policy variables. This model is given by Equation 9.

$$RR_{ct} = \alpha + \beta Tourism_{ct} + \delta_1 Generator_{ct} + \delta_2 Policy_{ct} + \gamma_1 Tourism_{ct} \times Generator_{ct} + \gamma_2 Tourism_{ct} \times Policy_{ct} + \gamma_3 Generator_{ct} \times Policy_{ct} + \theta Tourism_{ct} \times Generator_{ct} \times Policy_{ct} + \Gamma X_{ct} + \nu_c + \tau_t + \epsilon_{ct} \quad (9)$$

RR_{ct} still denotes the recycling rate of a county c in year t. The inclusion of the policy interactions and the triple interactions changes how we interpret these coefficients. β represents the effect of an increase in tourism on residential recycling rates in the pre-policy period. δ_1 represents the average difference between commercial and residential recycling rates in the pre-policy period when tourism equals zero. The interaction term γ_1 represents the difference in the effect of an increase in tourism on commercial and residential recycling rates in the pre-policy period. The total effect of tourism on commercial recycling rates would be estimated by adding β and γ_1. δ_2 represents the effect of the policy on residential recycling rates when tourism equals zero. γ_2 represents the effect of tourism on residential recycling rates in the post-policy period. γ_3 represents the difference in the effect of the policy on commercial and residential recycling rates when tourism is equal to zero. The triple interaction term, θ, represents the difference in the effect of tourism on commercial and residential generators in the post-policy period. The total effect of tourism on commercial generators in the post-policy period equals the sum of β, γ_1, γ_2, and θ.

In this specification, ν_c and τ_t still denote county and year fixed effects respectively. Finally, the term X_{ct} represents a vector containing control variables and their interactions with the generator types, their interactions with the policy variable, and their triple interactions. The term Γ represents the coefficients for these variables. This model specification allows us to expand our scope and examine how tourism effects policy efficacy across different generator types and directly compare these effects.

Additionally, we will present simplified models that aim at testing the same features without the need for extensive interactions. These models will be fixed effects models where we will separate out commercial and residential recycling rates to minimize the number of interactions. What we lose in our ability to directly compare commercial to residential rates, we gain in clarity. These models are represented by Equation 10.

$$RR_{ctg} = \alpha + \beta Tourism_{ct} + \delta Policy_{ct} + \gamma Tourism_{ct} \times Policy_{ct} + \Gamma X_{ct} + \nu_c + \tau_t + \epsilon_{ctg} \quad (10)$$

RR_{ctg} denotes the recycling rate of a given generator type g in county c in year t. The coefficient β represents the effect of an increase in tourism on a generators recycling rates in the pre-policy period. δ represents the difference in recycling rates for the given generator before and after the policy periods when tourism equals zero. The interaction term γ represents the difference in the effect of tourism on a generators recycling rate in the pre- and post-policy periods. Fixed effects and controls are included similarly to the previous models. This model allows us to isolate each generator type and speak about it directly, rather than in terms of the other. While we lose the ability to directly compare results, we gain a great deal of readability.

IV. Data

Panel data is collected from all 67 Florida counties over a period from 2001-2016. The outcome variable we are considering is the recycling rate, the total tonnage of waste recycled over the total tonnage of municipal solid waste (MSW). The recycling rate is calculated using MSW data collected from Solid Waste Management Annual Reports covering 2001 to 2016 produced by

the Florida Department of Environmental Protection's Division of Waste Management. This report is based on self-reported information provided by the Florida counties. These reports provide data based on generator type – commercial units, single family units, and multifamily units. By combining the data of single family units and multifamily units, we calculate an estimate of residential recycling rates which we compare directly to the commercial rate in our analysis. For each county in each year there are two outcomes recorded, a recycling rate for commercial and residential units. Certain counties are missing data in certain years, so a trimmed data set is created that brings the total number of counties from 67 to 53 (see appendix for which counties are included in each data set). While the majority of regressions are run using the trimmed dataset, models using the untrimmed dataset are also included. The summary statistics for commercial and residential recycling rates are presented in Table 1 for the trimmed dataset. Summary statistics for the untrimmed data set can be found in the appendix.

Table 1: Summary Statistics for Recycling Rates by Generator Types

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Obs	Mean	SD	Min	Max
Recycling Rate of County - Residential Units	848	21.32	12.87	0	63.34
Recycling Rate of County - Commercial Units	848	24.21	16.48	0	100

Notes: Summary statistics are based on trimmed data set used in majority of regressions.

Tourism, our main variable of interest, will be represented by an indicator. Ideally, we would be able to look at the number of tourists in a given county in a given year, however the availability of this data was extremely limited. Instead, we shall use the percentage of annual payroll in a county that is paid out by businesses classified as accommodation establishments as our indicator for tourism. We use the North American Industry Classification System (NAICS) to identify which businesses were accommodation establishments, specifically those coded as 721. This data was gathered from the annual County Business Patterns (CBP) report released by the United States Census Bureau for years 2001 – 2016. Data items are gathered from the Business Register (BR) which collects data on all known employers in the United States and is based on data collected through the Economic Census or through other Census surveys (US Census Bureau, 2021). The percentage of total of payroll devoted to an industry should provide a solid estimate of the roll that the industry plays in the local economy and should be closely tied to the amount of industry activity. To create this indicator, we pull the annual payroll from accommodation establishments and divide it from total payroll of a county to create percent values. Summary statistics for our tourism density indicator are presented in Table 2 for the trimmed data set. Summary statistics for the untrimmed data set can be found in the appendix.

Table 2: Summary Statistics for Accommodation Percentage

VARIABLES	(1) Obs	(2) Mean	(3) SD	(4) Min	(5) Max
Percentage of Annual Payroll in Accommodation Industry	848	1.52	2.80	0	18.39

Notes: Summary statistics are based on trimmed data set used in majority of regressions. Due to each county-year containing two observations, summary statistics are shown for observations where the generator type is commercial units to prevent doubling. Changing the generator type to residential units would have no effect on results shown.

We include two main sets of controls. The first set are taken from the Florida Solid Waste Management Reports and focus on recycling specific issues. These include availability and participation in recycling services for our generator types, the number of residential and commercial units in the county, the number of residents per residential unit, the county population, and the ratio of single-family to multi-family units. This data is gathered from county comprehensive plans and official Governor's Office population estimates. Other slow moving demographic variables should be largely controlled for within the county and time fixed effects.

The second set focuses on broad features of the county economy. Using the same CBP data set used for the tourism indicator, we generate three broad industry categories based on NAICS classifications: goods, other services, and public sectors. For each industry category, the total annual payroll is collected and then divided by the total payroll for the county in a given year. Including these industry controls isolates the effect of tourism. For example, we may find that once we control for all the other, non-accommodation services that tourism becomes insignificant and that any estimate we were producing was the result of an increase in the service sector rather than an increase in tourism. These economic features serve as a robustness check for our results. GDP per capita is also taken into account here as an economic control in line with the findings from Shultz *et al*. (1995) that find income as a significant predictor of recycling behavior. Data on total GDP is gathered from the Bureau of Economic analysis CAGDP9 data set, which provide real GDP in chained 2012 dollars by metropolitan statistical area and county. Chained-dollar values of GDP by county are calculated applying national chain-type price indexes to the current dollar values of GDP. The chain-type index formula that is used in the national accounts is then used to calculate the values of total real GDP by county and real GDP by county at more aggregated industry levels (Bureau of Economic Analysis, 2019). Summary statistics for both sets of controls can be found in the appendix.

V. Results and Discussion

Table 3. Regression of Recycling Rates by Generator Type on Tourism

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5
Percentage of Annual Payroll in Accommodation Industry	0.19	0.22	0.26	0.17	0.13
	(0.36)	(0.41)	(0.42)	(0.37)	(0.36)
=1 if Recycling Rate is from Commercial Unit	3.90***	3.90***	-6.75**	77.23	48.70
	(1.29)	(1.31)	(3.30)	(91.71)	(42.80)
Interaction of Accommodation and Generator Type	-0.66***	-0.66***	-0.74***	-0.56**	-0.41**
	(0.18)	(0.19)	(0.20)	(0.27)	(0.20)
Constant	21.04***	34.28***	51.44***	94.16	70.03
	(1.28)	(1.72)	(6.81)	(124.67)	(107.96)
County FE	NO	YES	YES	YES	YES
Year FE	NO	YES	YES	YES	YES
Industry Controls	NO	NO	YES	YES	YES
Other Controls	NO	NO	NO	YES	YES
Trimmed Data Set	YES	YES	YES	YES	NO
Observations	1,696	1,696	1,696	1,692	2,110
R-squared	0.01	0.46	0.47	0.51	0.53

Notes: Numbers in parentheses are clustered standard errors, clustered by county. *** p<.01, **p<0.05, *p<0.1. All controls are also interacted with the generator type variable and these interactions are included with the control variables. See appendix for unabridged table.

The estimates from our first set of analyses are presented in Table 3. These analyses aim to isolate hypotheses one and two which are focused on how tourism effects the recycling rates of different generator types. The story that comes forth from the data is clear and consistent. Across our various specifications, tourism has a negative and significant effect on the recycling rates of commercial units as represented by the interaction term. This interaction term represents the difference between how commercial and residential recycling rates react to changes in tourism. To find the total effect of tourism on recycling rates of commercial units we must add the coefficient on the tourism indicator to the interaction term. The magnitude of this total effect is consistent across the models and falls between the narrow range of -0.28 and -0.48 points. Holding all else equal, a standard deviation increase in the percentage of payroll in the accommodation industry, a change of approximately 2.8 points, decreases the predicted recycling rate of a county's commercial units by anywhere from .78 to 1.3 points according to these estimations. When we isolate the coefficients on the tourism indicator, we find the total effect of tourism density on residential recycling rates. These are consistently statistically insignificant and are less than half of the magnitude of the effect on commercial units with values ranging from 0.13 to 0.25. A standard deviation change in the tourism indicator changes the predicted recycling rate of a county's residential units by approximately 0.36 points to 0.7 points, though statistically we cannot assume that these effects are non-zero. Regardless, the net effect of tourism on a communities recycling rate, the result of adding together the total effects of tourism on residential and commercial rates, is decidedly negative.

These results provide support for Hypotheses One and Two as well as the CWMM proposed by this paper. We find evidence that, as predicted, tourism decreases the recycling behavior of commercial units while not effecting the recycling behavior of residents, resulting in net losses to the community. Using the CWMM, we can explain these changes through the increased reliance on consumer compliance for accommodation establishments and the decreased probability that tourists will participate in pro-environmental behavior such as recycling. We feel comfortable with stating that these effects are caused by increases in tourism specifically and not simply increases in the service sector generally because when controlling for major industries we see no major change in the magnitude or significance of our estimates. We can also rule out that these are simply the effects of county or time specific differences in demographics or recycling availability as these effects are controlled for by the fixed effects and controls included.

Table 4. Regression of Recycling Rates by Generator Type on Tourism and Policy

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5
Percentage of Annual Payroll in Accommodation Industry	0.07	-0.04	0.01	0.06	-0.05
	(0.30)	(0.22)	(0.27)	(0.26)	(0.22)
Interaction of Accommodation and Generator Type	-1.19***	-1.19***	-1.20***	-0.96***	-0.71***
	(0.23)	(0.23)	(0.24)	(0.33)	(0.26)
Interaction of Accommodation and FSRG	0.24	0.41	0.40	0.14	0.05
	(0.54)	(0.42)	(0.45)	(0.45)	(0.41)
Triple Interaction of Accommodation, FSRG, Generator Type	1.15***	1.15***	0.91**	0.75*	0.62*
	(0.41)	(0.41)	(0.38)	(0.42)	(0.37)
=1 if Recycling Rate is from Commercial Unit	4.06**	4.06**	-2.55	92.81	66.96
	(1.59)	(1.62)	(3.50)	(109.62)	(43.77)
Florida Statewide Recycling Goal (FSRG)	3.73**	6.48**	2.99	-30.42	-2.31
	(1.41)	(2.62)	(4.58)	(64.29)	(36.48)
Interaction of Commercial Units and FSRG	-0.27	-0.27	-10.46**	-7.56	-16.51
	(1.87)	(1.91)	(4.84)	(80.08)	(42.93)
Constant	19.41***	35.00***	50.85***	180.38	128.13
	(1.29)	(1.80)	(6.83)	(125.11)	(100.72)
County FE	NO	YES	YES	YES	YES
Year FE	NO	YES	YES	YES	YES
Industry and GDP Controls	NO	NO	YES	YES	YES
Other Controls	NO	NO	NO	YES	YES
Trimmed Data Set	YES	YES	YES	YES	NO
R-squared	0.05	0.47	0.49	0.55	0.57
Observations	1,696	1,696	1,696	1,692	2,110

Notes: Numbers in parentheses are clustered standard errors clustered by county. *** p<.01, **p<0.05, *p<0.1. All controls are also interacted with the generator type variable and these interactions are included with the control variables. See appendix for unabridged table.

The estimates from our second set of analyses are produced in Table 4. These analyses are designed to expand the scope and take into consideration that tourism has on policy efficacy as considered by Hypothesis Three. The results are consistent across our specification with regard to

our main variables of interest but they change the dynamics of our story. The interaction of our tourism indicator and the generator type here only represents the difference between how commercial and residential recycling rates react to changes in tourism in the pre-policy period. We can see that this effect is much larger than in the previous set of analyses which measured across all 16 years. To calculate the total effect of tourism on commercial recycling behavior in the pre-policy period, we add the estimates of the interaction term to the estimate for our tourism indicator. The magnitude of the total effect in the pre-policy period falls between -0.76 and -1.23 points, nearly three times the effect we saw in the previous models. A standard deviation increase in the percentage of payroll in the accommodation industry decreases the predicted recycling rate of a county's commercial units in the pre-policy period by anywhere from 2.13 to 3.44 points according to these estimations, which is also significantly more than in the previous specification. Isolating the coefficients on the tourism indicator denotes the total effect of tourism density on residential recycling rates in the pre-policy period. These total effects are much smaller than in the previous models, ranging from -0.05 to 0.07 points, and all of these effects are statistically insignificant. Adding these total effects together, we find the net effect of tourism on community recycling behavior was negative in the pre-policy period.

The story changes as we move into the post-policy period. The coefficients on the triple interaction term, which represents the difference between the effect of tourism on commercial and residential recycling rates in the post-policy period, are positive and significant. We then must add this value to the interaction of tourism and the policy and to the total effects of the pre-policy period to find the total effects of tourism on commercial recycling rates in the post-policy period. When we add together all terms, we find that the total effect of tourism on commercial recycling rates in the post-policy period ranges from a change of -0.09 and 0.33 points. The two models that include all of the controls both show negative total effects, though the magnitude of these total effects is very small, with both being less than 0.1 points of change to the recycling rate. Similar to the pre-policy period, there is no significant effect of tourism on residential recycling rates in the post-policy period. These coefficients are all positive, though we cannot assume they are non-zero. These findings make the net effect of tourism on community recycling rates in the post-policy period ambiguous.

These results do not support Hypothesis Three and change the context of our findings for Hypothesis One and Two. We maintain that tourism has a negative impact on commercial recycling rates but only in the absence of strong pro-recycling policy. Without a policy in place, these negative impacts to commercial recycling rates translate to a negative relationship between tourism and community recycling rates generally because tourism does not affect residential units. The Florida Statewide Recycling Goal appears to have created incentives for accommodation establishments to change their recycling behavior, converting this industry from a drag on recycling outcomes to a potential driver of recycling outcomes. At the very least, it is clear that the increase in tourism does not have a negative effect on the efficacy of the policy. This speaks to the efficacy of this policy in shaping recycling behavior and improving community outcomes. These results do not challenge the CWMM, as the increase in recycling behavior for accommodation industries can be explained by changes to the cost-benefit of implementing and maintaining a recycling outcome as a result of the need to comply with policy.

Table 5. Simplified Regression of Recycling Rates by Generator Type on Tourism and Policy

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5
Commercial Generators					
Percentage of Annual Payroll in Accommodation Industry	-1.12***	-1.01**	-0.98*	-0.70*	-0.70**
	(0.26)	(0.43)	(0.58)	(0.35)	(0.31)
Florida Statewide Recycling Goal (FSRG)	3.46**	9.55**	-3.00	-85.32	-46.14
	(1.50)	(3.78)	(4.90)	(69.71)	(32.56)
Interaction of Accommodation and FSRG	1.39**	1.63***	1.38***	0.80	0.75
	(0.53)	(0.39)	(0.40)	(0.51)	(0.49)
Constant	23.48***	38.12***	49.81***	-25.65	-58.40
	(1.70)	(1.89)	(7.82)	(152.34)	(149.45)
R-squared	0.05	0.59	0.61	0.65	0.67
Observations	848	848	848	846	1,055
Residential Generators					
Percentage of Annual Payroll in Accommodation Industry	0.07	-0.26	-0.20	-0.14	-0.11
	(0.30)	(0.29)	(0.29)	(0.27)	(0.23)
Florida Statewide Recycling Goal (FSRG)	3.73**	3.13	-1.49	16.93	25.01
	(1.41)	(2.65)	(4.67)	(64.45)	(36.38)
Interaction of Accommodation and FSRG	0.24	0.35	0.34	0.24	-0.02
	(0.54)	(0.49)	(0.53)	(0.44)	(0.40)
Constant	19.41***	35.95***	49.35***	479.22***	381.61***
	(1.29)	(1.65)	(7.62)	(153.98)	(134.81)
R-squared	0.03	0.51	0.52	0.57	0.61
Observations	848	848	848	846	1,055
County FE	NO	YES	YES	YES	YES
Year FE	NO	YES	YES	YES	YES
Industry Controls	NO	NO	YES	YES	YES
Other Controls	NO	NO	NO	YES	YES
Trimmed Data Set	YES	YES	YES	YES	NO

Notes: Numbers in parentheses are clustered standard errors clustered by county. *** p<.01, **p<0.05, *p<0.1. All controls are also interacted with the policy variable and these interactions are included with the control variables. See appendix for unabridged table.

Table 5 presents the estimates from our simplified model where instead of using interactions to directly compare the generator types, we test the generator types separately. This allows for a more direct interpretation of the variables and a confirmation of our findings from previous specifications. For commercial generators, we see significant, negative coefficients on tourism across all models. This indicates that the total effect of tourism on commercial generators is negative in the pre-policy period. In every model, the interaction of policy and tourism is positive and has a higher magnitude than the coefficient on just tourism. The interaction of tourism and the policy is significant in the first three models, so we can conclude with confidence that the total effect of tourism on commercial recycling rates in the post-policy period is positive in these models. However, in the last two models, the coefficients on the interaction of tourism and the

policy results are not significant while the coefficients on the tourism indicator are. For these two models, we cannot say with confidence whether or not the total effect of tourism is positive or negative in the post-policy period, though they appear to lean positive as well.

When we consider the residential generators, we find that tourism has a small, negative and insignificant effect on residential recycling rates in the pre-policy period in four of the models. Tourism had a small, positive and insignificant effect only in the model that does not include fixed effects. This is different from what we saw in the previous specifications where the effect of tourism was positive and insignificant across the board. The coefficient on the interaction of tourism and the policy was positive and insignificant across all the models that used the trimmed data set and was negative and insignificant in the model which used the untrimmed data set. The magnitudes of this interaction coefficient were larger than that of the coefficient on the tourism indicator in the trimmed data set models, making the total effect of tourism on residential rates in the post-policy period positive across these four models. The total effect of tourism on residential rates in the post-policy period was negative in the model using the untrimmed data sets. However, because none of these coefficients are significant we cannot claim with confidence that they, and the effects calculated using them, are non-zero.

We can combine these estimates of total effects to come up with a net effect of tourism on community rates in both periods. In the pre-policy period, the total effect of tourism on commercial rates was negative and significant with values ranging from -0.7 to -1.12. Over the same period, the total effect of tourism on residential rates ranged from positive to negative but were insignificant with values of -0.26 to 0.07. We can say with confidence that the net effect of tourism on community recycling rates in the pre-policy period was negative. In the post-policy period, the total effect of tourism on commercial recycling rates was positive, however due to insignificance of the interaction term in two of the models, we cannot make as strong a claim about these total effects. These effects had values ranging from 0.05 to 0.062. In this same period, the total effect on residential rates ranged from positive negative but were all insignificant with values ranging from -0.13 to 0.31. Because of the issues of insignificant we are once again left with an ambiguous net effect of tourism on community recycling outcomes.

These results reflect similar patterns as the previous specification. Tourism has a negative and significant effect on commercial recycling behavior in the pre-policy period that outweigh the effects of tourism on residential recycling behavior which leads to tourism having a net negative effect on community recycling rates. In the post-policy period, the negative effect of tourism on commercial recycling behaviors is greatly reduced which improves community recycling outcomes, though we cannot say if tourism continues to have a negative effect or not. Regardless, it is clear that the increase in tourism does not negatively affect the efficacy of the policy. These findings are in line with the CWMM since the increase in recycling behavior by commercial units is a direct result of shifts to the cost-benefits of recycling due to shifts in regulation.

VI. Conclusion

This paper aims to examine the relationship between tourism density and recycling rates, a key indicator for waste reduction and environmental sustainability policies, in Florida counties over the period from 2001 – 2016. Using the literature, this paper establishes a CWMM based on elements of the theory of planned behavior which models the determinants of recycling behavior for commercial units and residential units. We used this model as the foundation for our hypotheses and interpreting our findings. The first hypothesis predicts that an increase in tourism density will, holding all else equal, cause a reduction in the commercial recycling rate. This is reasoned from the concept that accommodation establishments are more dependent on consumer compliance for their recycling behavior. Additionally, consumer compliance of tourists is likely to be lower than average residents due to changes in their recycling determinants such as higher opportunity costs, less knowledge, and fewer social pressures. The second hypothesis was that an increase in tourism density will, holding all else equal, decrease the community recycling rate. This is based on the understanding of residential determinants established by the CWMM and the lack of a mechanism for relating tourism specifically to residential behavior. Because residents recycling outcomes would not be affected by tourism, if tourism had a negative effect on commercial units, community outcomes should also be negatively affected by tourism. The third hypothesis predicts that an increase in tourism will, holding all else equal, cause a reduction in the effect of pro-environmental policies. This hypothesis follows from similar reasoning as the first.

Three fixed effects specifications are used to test these hypotheses. The empirical analysis strongly supports Hypothesis One, with increased tourist density driving down the recycling rates of commercial units. However, this was only true in the case where a strong pro-recycling policy was not in place. Strong policies appear to change the costs-benefits of accommodation establishments which reduces the negative effects of tourism and raise community recycling behavior. Across our estimates, we find that a one point increase in the percentage of county payroll in the accommodation industry results in a decrease in the recycling rates of commercial units of approximately 0.7 to 1.2 point when there is no policy in place. With a policy, the effect of tourism on commercial recycling rates is ambiguous. The analysis provides strong evidence for Hypothesis Two with a similar caveat as Hypothesis One. We find that in the pre-policy periods, commercial recycling rates are negatively and significantly affected by tourism and that residential rates are not significantly affected by tourism. As a result, if tourism increases in a county without a strong recycling policy, the community recycling rate is likely to decline as a result of the negative effect on commercial rates. However, with a policy in place, it is not clear if the net effects of tourism are positive or negative because the effect of tourism on commercial recycling rates is ambiguous. The empirical analysis does not support Hypothesis Three, with tourism having a positive relationship with the state policy. The effectiveness of the policy is not negatively affected by the amount of tourism in the county. The Florida Statewide Recycling Goal has done well to mitigate the negative effects of tourism by changing the net benefits of increasing recycling behavior for accommodation establishments in Florida. These results provide support for this CWMM as a model for predicting the aggregate recycling behavior of communities composed of firms and individuals.

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Appendix

Table A.1. Counties in Each Data Set and Number of Observations per County

County Name	Data Set	Freq.	County Name	Data Set	Freq.
Alachua	Both	32	Lee	Both	32
Baker	Both	32	Leon	Both	32
Bay	Both	32	Levy	Both	32
Bradford	Both	32	Liberty	Only Untrimmed	30
Brevard	Both	32	Madison	Both	32
Broward	Only Untrimmed	30	Manatee	Only Untrimmed	30
Calhoun	Both	32	Marion	Only Untrimmed	30
Charlotte	Both	32	Martin	Only Untrimmed	30
Citrus	Both	32	Miami-Dade	Both	32
Clay	Both	32	Monroe	Both	32
Collier	Both	32	Nassau	Both	32
Columbia	Both	32	Okaloosa	Both	32
Desoto	Both	32	Okeechobee	Both	32
Dixie	Only Untrimmed	30	Orange	Both	32
Duval	Both	32	Osceola	Both	32
Escambia	Both	32	Palm Beach	Only Untrimmed	30
Flagler	Both	32	Pasco	Both	32
Franklin	Both	32	Pinellas	Both	32
Gadsden	Both	32	Polk	Only Untrimmed	30
Gilchrist	Both	32	Putnam	Both	32
Glades	Both	32	Santa Rosa	Both	32
Gulf	Both	32	Sarasota	Only Untrimmed	28
Hamilton	Both	32	Seminole	Only Untrimmed	30
Hardee	Both	32	St. Johns	Only Untrimmed	30
Hendry	Both	32	St. Lucie	Only Untrimmed	30
Hernando	Only Untrimmed	30	Sumter	Both	32
Highlands	Both	32	Suwannee	Both	32
Hillsborough	Both	32	Taylor	Both	32
Holmes	Both	32	Union	Both	32
Indian River	Only Untrimmed	30	Volusia	Both	32
Jackson	Both	32	Wakulla	Both	32
Jefferson	Both	32	Walton	Both	32
Lafayette	Both	32	Washington	Both	32
Lake	Both	32			
Total		1,080			1,034

Table A.2. Summary Statistics of Recycling Rates in Untrimmed Data Set

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Obs	Mean	SD	Min	Max
Recycling Rate of County - Residential Units	1,057	22.80	13.41	0	66.96
Recycling Rate of County - Commercial Units	1,057	25.27	16.45	0	100

Table A.3. Summary Statistics of Tourism Indicator in Untrimmed Data Set

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Obs	Mean	SD	Min	Max
Percentage of Annual Payroll in Accommodation Industry	1,057	1.34	2.54	0.00	18.39

Table A.4. Summary Statistics of Control Variables in Trimmed Data Set

VARIABLES	(1) Obs	(2) Mean	(3) SD	(4) Min	(5) Max
Total Commercial Units in County	848.00	9,114.49	18,127.91	0.00	158,667.00
Total Number of Multi-Family Units in County	848.00	25,460.28	68,635.03	0.00	509,058.00
Average Number Residents Per Multi-Family Unit	848.00	3.36	23.70	0.00	692.00
Total Number of Single-Family Units in County	848.00	109,271.27	1,067,982.16	0.00	31008000.00
Average Number Residents Per Single-Family Unit	848.00	42.88	1,124.42	0.00	32,716.00
% Commercial units w/ Scheduled Service available	848.00	63.76	45.14	0.00	100.00
% Commercial units w/ On Call Service Available	848.00	39.39	47.11	0.00	100.00
% Commercial units participating in scheduled service if available	848.00	26.34	31.12	0.00	100.00
% Commercial units participating in on call service if available	848.00	12.71	27.09	0.00	100.00
% of Multi-Family units with service available	848.00	37.29	44.55	0.00	100.00
% of Multi-Family units with participating in service if available	848.00	24.65	32.00	0.00	100.00
% of Single-Family units with service available	848.00	48.00	45.38	0.00	100.00
% of Single-Family units with participating in service if available	848.00	37.96	35.68	0.00	100.00
Recycling Rate of County by Generator Type	848.00	24.21	16.48	0.00	100.00
Percentage of Annual Payroll in Accommodation Industry	848.00	1.52	2.80	0.00	18.39
Percentage of Annual Payroll in Goods Industry	848.00	16.82	10.00	0.00	59.63
Percentage of Annual Payroll in Other Services Industry	848.00	70.17	16.79	0.00	92.14
Percentage of Annual Payroll in Public Sector Industry	848.00	0.03	0.18	0.00	2.59
Total Real GDP	848.00	10221230.67	21621701.17	146,333.00	136396875.00
Florida Statewide Recycling Goal (FSRG)	848.00	0.44	0.50	0.00	1.00
Real GDP Per 100,000 People	848.00	3,090,232.83	1,157,257.29	1,526,872.88	6,801,900.50
Real GDP Per 100,000 People (ln)	848.00	14.88	0.35	14.24	15.73
Population in Thousands	848.00	235.99	418.99	5.91	2,700.79
Population in Thousands (ln)	848.00	4.41	1.44	1.78	7.90
Number of Residential Units	848.00	134,731.55	1,075,030.26	0.00	31008000.00
Percentage of Residential Units that are Single-Family Units	846.00	87.03	12.54	38.46	100.00

Table A.5. Summary Statistics of Control Variables in Untrimmed Data Set

VARIABLES	(1) Obs	(2) Mean	(3) SD	(4) Min	(5) Max
Total Commercial Units in County	1,057.00	10,822.58	19,760.52	0.00	166,801.00
Total Number of Multi-Family Units in County	1,057.00	32,834.49	76,980.91	0.00	509,058.00
Average Number Residents Per Multi-Family Unit	1,057.00	3.16	21.23	0.00	692.00
Total Number of Single-Family Units in County	1,057.00	113,204.80	957,945.25	0.00	31008000.00
Average Number Residents Per Single-Family Unit	1,057.00	34.94	1,007.15	0.00	32,716.00
% Commercial units w/ Scheduled Service available	1,057.00	67.25	43.99	0.00	100.00
% Commercial units w/ On Call Service Available	1,057.00	37.24	46.73	0.00	100.00
% Commercial units participating in scheduled service if available	1,057.00	27.61	30.46	0.00	100.00
% Commercial units participating in on call service if available	1,057.00	11.74	25.91	0.00	100.00
% of Multi-Family units with service available	1,057.00	41.56	45.77	0.00	100.00
% of Multi-Family units with participating in service if available	1,057.00	27.11	32.41	0.00	100.00
% of Single-Family units with service available	1,057.00	54.23	45.30	0.00	100.00
% of Single-Family units with participating in service if available	1,057.00	42.09	35.18	0.00	100.00
Recycling Rate of County by Generator Type	1,057.00	25.27	16.45	0.00	100.00
Percentage of Annual Payroll in Accommodation Industry	1,057.00	1.34	2.54	0.00	18.39
Percentage of Annual Payroll in Goods Industry	1,057.00	17.33	10.39	0.00	61.49
Percentage of Annual Payroll in Other Services Industry	1,057.00	70.86	17.37	0.00	92.14
Percentage of Annual Payroll in Public Sector Industry	1,057.00	0.03	0.19	0.00	2.84
Total Real GDP	1,057.00	11541002.20	22095421.25	146,333.00	136396875.00
Florida Statewide Recycling Goal (FSRG)	1,057.00	0.44	0.50	0.00	1.00
Real GDP Per 100,000 People	1,057.00	3,183,906.22	1,371,427.44	630,403.88	10139753.00
Real GDP Per 100,000 People (ln)	1,057.00	14.89	0.41	13.35	16.13
Population in Thousands	1,057.00	273.38	438.61	5.91	2,700.79
Population in Thousands (ln)	1,057.00	4.60	1.48	1.78	7.90
Number of Residential Units	1,057.00	146,039.29	967,635.32	0.00	31008000.00
Percentage of Residential Units that are Single-Family Units	1,055.00	85.29	13.22	38.46	100.00

Table A.6. Regression of Recycling Rates by Generator Type on Tourism (Table 3) - Unabridged

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5
Percentage of Annual Payroll in Accommodation Industry	0.19	0.22	0.26	0.17	0.13
	(0.36)	(0.41)	(0.42)	(0.37)	(0.36)
=1 if Recycling Rate is from Commercial Unit	3.90***	3.90***	-6.75**	77.23	48.70
	(1.29)	(1.31)	(3.30)	(91.71)	(42.80)
Interaction of Accommodation and Generator Type	-0.66***	-0.66***	-0.74***	-0.56**	-0.41**
	(0.18)	(0.19)	(0.20)	(0.27)	(0.20)
Percentage of Annual Payroll in Goods Industry			-0.07	-0.07	-0.09
			(0.06)	(0.07)	(0.06)
Percentage of Annual Payroll in Other Services Industry			-0.19**	-0.08	-0.11*
			(0.08)	(0.07)	(0.06)
Percentage of Annual Payroll in Public Sector Industry			-3.40	-1.13	1.04
			(3.01)	(3.45)	(2.80)
Interaction of Goods and Generator Type			0.07	0.07	0.05
			(0.08)	(0.08)	(0.07)
Interaction of Other Services and Generator Type			0.14**	0.01	0.01
			(0.06)	(0.05)	(0.04)
Interaction of Public Sector and Generator Type			-1.48	-5.04	-6.20
			(5.45)	(5.55)	(4.33)
Real GDP Per 100,000 People (ln)				-0.16	1.60
				(7.35)	(5.99)
Population in Thousands (ln)				-11.40	-11.15
				(7.08)	(6.91)
Total Commercial Units in County				-0.00	-0.00
				(0.00)	(0.00)
Total Number of Multi-Family Units in County				-0.00	-0.00
				(0.00)	(0.00)
Total Number of Single-Family Units in County				0.00***	0.00***
				(0.00)	(0.00)
Average Number Residents Per Multi-Family Unit				0.22	0.08
				(0.32)	(0.26)
Average Number Residents Per Single-Family Unit				-0.00	-0.00
				(0.01)	(0.01)
% Commercial units w/ Scheduled Service available				0.02	0.02
				(0.02)	(0.02)
% Commercial units w/ On Call Service Available				-0.00	-0.00
				(0.02)	(0.02)
% Commercial units participating in scheduled service if available				0.05**	0.03*
				(0.02)	(0.02)
% Commercial units participating in on call service if available				-0.03*	-0.02
				(0.02)	(0.02)
% of Multi-Family units with service available				0.02	0.02
				(0.02)	(0.02)
% of Multi-Family units participating in service if available				-0.02	-0.02
				(0.03)	(0.03)
% of Single-Family units with service available				-0.02	-0.00
				(0.04)	(0.03)
% of Single-Family units participating in service if available				0.07***	0.05**
				(0.02)	(0.02)
Percentage of Residential Units that are Single-Family Units				0.09	0.08
				(0.08)	(0.08)
Interaction of Real GDP Per 100,000 People (ln) and Generator Type				-5.29	-3.60
				(6.35)	(3.09)
Interaction of Population in Thousands (ln) and Generator Type				1.32	0.79
				(1.92)	(1.54)
Interaction of Total Commercial Units in County and Generator Type				0.00*	0.00
				(0.00)	(0.00)
Interaction of Total Number of Multi-Family Units in County and Generator Type				0.00*	0.00***

				(0.00)	(0.00)
Interaction of Total Number of Single-Family Units in County and Generator Type				-0.00	0.00
				(0.00)	(0.00)
Interaction of Average Number Residents Per Multi-Family Unit and Generator Type				-0.19	-0.05
				(0.25)	(0.28)
Interaction of Average Number Residents Per Single-Family Unit and Generator Type				0.00	0.00
				(0.01)	(0.01)
Interaction of % Commercial units w/ Scheduled Service available and Generator Type				-0.04	-0.03
				(0.03)	(0.03)
Interaction of % Commercial units w/ On Call Service Available and Generator Type				0.00	0.01
				(0.02)	(0.02)
Interaction of % Commercial units participating in scheduled service if available and Generator Type				-0.02	0.01
				(0.03)	(0.03)
Interaction of % Commercial units participating in on call service if available and Generator Type				0.04	0.03
				(0.03)	(0.03)
Interaction of % of Multi-Family units with service available and Generator Type				-0.03	-0.03
				(0.04)	(0.03)
Interaction of % of Multi-Family units participating in service if available and Generator Type				0.04	0.02
				(0.05)	(0.04)
Interaction of % of Single-Family units with service available and Generator Type				0.05	0.04
				(0.05)	(0.04)
Interaction of % of Single-Family units participating in service if available and Generator Type				-0.06*	-0.04
				(0.03)	(0.03)
Interaction of Percentage of Residential Units that are Single-Family Units and Generator Type				-0.02	0.02
				(0.09)	(0.09)
Constant	21.04***	34.28***	51.44***	94.16	70.03
	(1.28)	(1.72)	(6.81)	(124.67)	(107.96)
County FE	NO	YES	YES	YES	YES
Year FE	NO	YES	YES	YES	YES
Trimmed Data Set	YES	YES	YES	YES	NO
R-squared	0.01	0.46	0.47	0.51	0.53
Observations	1,696	1,696	1,696	1,692	2,110

Table A.7. Regression of Recycling Rates by Generator Type on Tourism and Policy (Table 4)– Unabridged

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5
Percentage of Annual Payroll in Accommodation Industry	0.07	-0.04	0.01	0.06	-0.05
	(0.30)	(0.22)	(0.27)	(0.26)	(0.22)
Interaction of Accommodation and Generator Type	-1.19***	-1.19***	-1.20***	-0.96***	-0.71***
	(0.23)	(0.23)	(0.24)	(0.33)	(0.26)
Interaction of Accommodation and FSRG	0.24	0.41	0.40	0.14	0.05
	(0.54)	(0.42)	(0.45)	(0.45)	(0.41)
Triple Interaction of Accommodation, FSRG, Generator Type	1.15***	1.15***	0.91**	0.75*	0.62*
	(0.41)	(0.41)	(0.38)	(0.42)	(0.37)
=1 if Recycling Rate is from Commercial Unit	4.06**	4.06**	-2.55	92.81	66.96
	(1.59)	(1.62)	(3.50)	(109.62)	(43.77)
Florida Statewide Recycling Goal (FSRG)	3.73**	6.48**	2.99	-30.42	-2.31
	(1.41)	(2.62)	(4.58)	(64.29)	(36.48)
Interaction of Commercial Units and FSRG	-0.27	-0.27	-10.46**	-7.56	-16.51
	(1.87)	(1.91)	(4.84)	(80.08)	(42.93)
Percentage of Annual Payroll in Goods Industry			-0.11	-0.09	-0.08
			(0.09)	(0.08)	(0.07)
Percentage of Annual Payroll in Other Services Industry			-0.17**	-0.06	-0.08
			(0.08)	(0.08)	(0.07)
Percentage of Annual Payroll in Public Sector Industry			-3.40	-0.93	1.10
			(3.06)	(3.37)	(2.65)
Interaction of Goods and Generator Type			0.15	0.10	0.07
			(0.12)	(0.11)	(0.10)
Interaction of Goods and FSRG			0.11	0.04	-0.04
			(0.14)	(0.13)	(0.10)
Triple Interaction of Goods, FSRG, Generator Type			-0.21	-0.07	-0.01
			(0.18)	(0.17)	(0.15)
Interaction of Other Services and Generator Type			0.06	0.02	0.02
			(0.06)	(0.08)	(0.07)
Interaction of Other Services and FSRG			0.02	0.03	0.05
			(0.05)	(0.07)	(0.06)
Triple Interaction of Other Services, FSRG, Generator Type			0.19**	0.10	0.02
			(0.07)	(0.12)	(0.10)
Interaction of Public Sector and Generator Type			-0.03	-1.66	-2.43
			(5.21)	(5.19)	(4.06)
Interaction of Public Sector and FSRG			-65.75	-79.72	-70.90
			(77.59)	(75.57)	(78.65)
Triple Interaction of Public Sector, FSRG, Generator Type			114.05	72.92	47.69
			(105.02)	(100.73)	(106.63)
Real GDP Per 100,000 People (ln)				-4.45	-1.53
				(7.08)	(5.33)
Population in Thousands (ln)				-14.56*	-13.39*
				(8.18)	(7.16)
Total Commercial Units in County				-0.00	-0.00
				(0.00)	(0.00)
Total Number of Multi-Family Units in County				-0.00**	-0.00
				(0.00)	(0.00)
Total Number of Single-Family Units in County				0.00***	0.00***
				(0.00)	(0.00)
Average Number Residents Per Multi-Family Unit				0.13	0.06
				(0.26)	(0.23)
Average Number Residents Per Single-Family Unit				-0.00	-0.00
				(0.01)	(0.00)
% Commercial units w/ Scheduled Service available				0.01	-0.00
				(0.02)	(0.02)
% Commercial units w/ On Call Service Available				-0.01	-0.01
				(0.02)	(0.02)
% Commercial units participating in scheduled service if available				0.09***	0.07***
				(0.02)	(0.02)

% Commercial units participating in on call service if available	-0.05**	-0.04*
	(0.02)	(0.02)
% of Multi-Family units with service available	0.02	0.02
	(0.02)	(0.02)
% of Multi-Family units participating in service if available	-0.06	-0.05
	(0.04)	(0.03)
% of Single-Family units with service available	-0.00	0.00
	(0.04)	(0.03)
% of Single-Family units participating in service if available	0.07***	0.06**
	(0.03)	(0.02)
Percentage of Residential Units that are Single-Family Units	0.02	0.08
	(0.09)	(0.08)
Interaction of Real GDP Per 100,000 People (ln) and Generator Type	-6.61	-5.05
	(7.59)	(3.31)
Interaction of Real GDP Per 100,000 People (ln) and FSRG	1.90	0.58
	(4.26)	(2.42)
Triple Interaction of Real GDP Per 100,000 People (ln), FSRG, Generator Type	1.41	2.52
	(5.34)	(2.80)
Interaction of Population in Thousands (ln) and Generator Type	0.42	-0.29
	(2.46)	(1.96)
Interaction of Population in Thousands (ln) and FSRG	1.39	0.82
	(1.78)	(1.56)
Triple Interaction of Population in Thousands (ln), FSRG, Generator Type	-0.29	0.41
	(2.00)	(1.79)
Interaction of Total Commercial Units in County and Generator Type	0.00	0.00*
	(0.00)	(0.00)
Interaction of Total Commercial Units in County and FSRG	-0.00	0.00
	(0.00)	(0.00)
Triple Interaction of Total Commercial Units in County, FSRG, Generator Type	-0.00	-0.00*
	(0.00)	(0.00)
Interaction of Total Number of Multi-Family Units in County and Generator Type	0.00*	0.00***
	(0.00)	(0.00)
Interaction of Total Number of Multi-Family Units in County and FSRG	0.00**	0.00
	(0.00)	(0.00)
Triple Interaction of Total Number of Multi-Family Units in County, FSRG, Generator Type	-0.00**	-0.00
	(0.00)	(0.00)
Interaction of Total Number of Single-Family Units in County and Generator Type	-0.00	-0.00
	(0.00)	(0.00)
Interaction of Total Number of Single-Family Units in County and FSRG	-0.00**	-0.00**
	(0.00)	(0.00)
Triple Interaction of Total Number of Single-Family Units in County, FSRG, Generator Type	0.00***	0.00***
	(0.00)	(0.00)
Interaction of Average Number Residents Per Multi-Family Unit and Generator Type	-0.17	-0.16
	(0.24)	(0.27)
Interaction of Average Number Residents Per Multi-Family Unit and FSRG	1.38	0.96
	(0.96)	(0.94)
Triple Interaction of Average Number Residents Per Multi-Family Unit, FSRG, Generator Type	0.56	1.07
	(1.30)	(1.20)

Interaction of Average Number Residents Per Single-Family Unit and Generator Type	0.00	0.00
	(0.01)	(0.01)
Interaction of Average Number Residents Per Single-Family Unit and FSRG	-1.15	-0.65
	(1.53)	(1.52)
Triple Interaction of Average Number Residents Per Single-Family Unit, FSRG, Generator Type	-0.15	-2.08
	(1.86)	(2.25)
Interaction of % Commercial units w/ Scheduled Service available and Generator Type	-0.03	-0.02
	(0.03)	(0.03)
Interaction of % Commercial units w/ Scheduled Service available and FSRG	0.04*	0.06**
	(0.02)	(0.02)
Triple Interaction of % Commercial units w/ Scheduled Service available, FSRG, Generator Type	-0.01	-0.04
	(0.04)	(0.04)
Interaction of % Commercial units w/ On Call Service Available and Generator Type	0.01	0.01
	(0.03)	(0.02)
Interaction of % Commercial units w/ On Call Service Available and FSRG	0.01	0.00
	(0.02)	(0.02)
Triple Interaction of % Commercial units w/ On Call Service Available, FSRG, Generator Type	-0.04	-0.03
	(0.03)	(0.03)
Interaction of % Commercial units participating in scheduled service if available and Generator Type	-0.06*	-0.04
	(0.03)	(0.03)
Interaction of % Commercial units participating in scheduled service if available and FSRG	-0.09**	-0.08**
	(0.04)	(0.03)
Triple Interaction of % Commercial units participating in scheduled service if available, FSRG, Generator Type	0.08	0.07
	(0.05)	(0.05)
Interaction of % Commercial units participating in on call service if available and Generator Type	0.04	0.03
	(0.03)	(0.04)
Interaction of % Commercial units participating in on call service if available and FSRG	0.04	0.04
	(0.03)	(0.03)
Triple Interaction of % Commercial units participating in on call service if available, FSRG, Generator Type	0.03	0.01
	(0.05)	(0.06)
Interaction of % of Multi-Family units with service available and Generator Type	-0.02	-0.03
	(0.04)	(0.03)
Interaction of % of Multi-Family units with service available and FSRG	-0.00	-0.01
	(0.04)	(0.03)
Triple Interaction of % of Multi-Family units with service available, FSRG, Generator Type	0.02	0.02
	(0.05)	(0.05)
Interaction of % of Multi-Family units participating in service if available and Generator Type	0.12**	0.10**
	(0.06)	(0.05)
Interaction of % of Multi-Family units participating in service if available and FSRG	0.06	0.08*
	(0.05)	(0.04)
Triple Interaction of % of Multi-Family units participating in service if available, FSRG, Generator Type	-0.20**	-0.18***

				(0.08)	(0.07)
Interaction of % of Single-Family units with service available and Generator Type				0.01	0.01
				(0.05)	(0.04)
Interaction of % of Single-Family units with service available and FSRG				-0.05	-0.04
				(0.03)	(0.03)
Triple Interaction of % of Single-Family units with service available, FSRG, Generator Type				0.06	0.06
				(0.05)	(0.04)
Interaction of % of Single-Family units participating in service if available and Generator Type				-0.08**	-0.08**
				(0.03)	(0.03)
Interaction of % of Single-Family units participating in service if available and FSRG				0.00	-0.02
				(0.05)	(0.04)
Triple Interaction of % of Single-Family units participating in service if available, FSRG, Generator Type				0.09	0.10
				(0.08)	(0.07)
Interaction of Percentage of Residential Units that are Single-Family Units and Generator Type				0.06	0.11
				(0.14)	(0.11)
Interaction of Percentage of Residential Units that are Single-Family Units and FSRG				0.04	-0.04
				(0.11)	(0.09)
Triple Interaction of Percentage of Residential Units that are Single-Family Units, FSRG, Generator Type				-0.26	-0.25*
				(0.15)	(0.13)
Constant	19.41***	35.00***	50.85***	180.38	128.13
	(1.29)	(1.80)	(6.83)	(125.11)	(100.72)
County FE	NO	YES	YES	YES	YES
Year FE	NO	YES	YES	YES	YES
Trimmed Data Set	YES	YES	YES	YES	NO
R-squared	0.05	0.47	0.49	0.55	0.57
Observations	1,696	1,696	1,696	1,692	2,110

Table A.8. Simplified Regression of Recycling Rates by Generator Type on Tourism and Policy (Table 5) – Unabridged

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5
Commercial Units					
Percentage of Annual Payroll in Accommodation Industry	-1.12***	-1.01**	-0.98*	-0.70*	-0.70**
	(0.26)	(0.43)	(0.58)	(0.35)	(0.31)
Florida Statewide Recycling Goal (FSRG)	3.46**	9.55**	-3.00	-85.32	-46.14
	(1.50)	(3.78)	(4.90)	(69.71)	(32.56)
Interaction of Accommodation and FSRG	1.39**	1.63***	1.38***	0.80	0.75
	(0.53)	(0.39)	(0.40)	(0.51)	(0.49)
Percentage of Annual Payroll in Goods Industry			0.05	0.03	0.04
			(0.12)	(0.11)	(0.09)
Percentage of Annual Payroll in Other Services Industry			-0.14	-0.01	-0.03
			(0.09)	(0.09)	(0.09)
Percentage of Annual Payroll in Public Sector Industry			-5.47*	-1.99	-1.38
			(2.76)	(2.72)	(1.91)
Interaction of Goods and FSRG			-0.11	-0.11	-0.08
			(0.11)	(0.13)	(0.10)
Interaction of Other Services and FSRG			0.19***	0.12	0.06
			(0.05)	(0.08)	(0.07)
Interaction of Public Sector and FSRG			22.02	-32.77	-20.81
			(94.84)	(79.00)	(76.97)
Real GDP Per 100,000 People (ln)				0.84	2.94
				(7.89)	(7.38)
Population in Thousands (ln)				5.89	5.59
				(13.35)	(12.28)
Total Commercial Units in County				0.00**	0.00**
				(0.00)	(0.00)
Total Number of Multi-Family Units in County				-0.00	0.00
				(0.00)	(0.00)
Total Number of Single-Family Units in County				0.00***	0.00***
				(0.00)	(0.00)
Average Number Residents Per Multi-Family Unit				-0.04	-0.11
				(0.30)	(0.28)
Average Number Residents Per Single-Family Unit				0.00	0.00
				(0.01)	(0.01)
% Commercial units w/ Scheduled Service available				0.01	0.01
				(0.02)	(0.02)
% Commercial units w/ On Call Service Available				0.01	0.01
				(0.02)	(0.02)
% Commercial units participating in scheduled service if available				0.04	0.04
				(0.03)	(0.03)
% Commercial units participating in on call service if available				-0.02	-0.02
				(0.03)	(0.03)
% of Multi-Family units with service available				0.01	0.01
				(0.02)	(0.02)
% of Multi-Family units participating in service if available				0.08**	0.06*
				(0.04)	(0.03)
% of Single-Family units with service available				-0.01	-0.01
				(0.04)	(0.03)
% of Single-Family units participating in service if available				0.01	-0.01
				(0.03)	(0.03)
Percentage of Residential Units that are Single-Family Units				0.13	0.19**
				(0.08)	(0.09)
Interaction of Real GDP Per 100,000 People (ln) and FSRG				5.78	3.89*
				(4.54)	(2.25)
Interaction of Population in Thousands (ln) and FSRG				2.67	2.78*
				(1.88)	(1.60)
Interaction of Total Commercial Units in County and FSRG				-0.00***	-0.00***
				(0.00)	(0.00)

Interaction of Total Number of Multi-Family Units in County and FSRG				0.00	-0.00
				(0.00)	(0.00)
Interaction of Total Number of Single-Family Units in County and FSRG				0.00	0.00
				(0.00)	(0.00)
Interaction of Average Number Residents Per Multi-Family Unit and FSRG				2.42**	2.05**
				(0.93)	(0.92)
Interaction of Average Number Residents Per Single-Family Unit and FSRG				-1.16	-1.17
				(1.84)	(1.60)
Interaction of % Commercial units w/ Scheduled Service available and FSRG				0.03	0.02
				(0.03)	(0.03)
Interaction of % Commercial units w/ On Call Service Available and FSRG				-0.04*	-0.04*
				(0.02)	(0.02)
Interaction of % Commercial units participating in scheduled service if available and FSRG				0.01	0.01
				(0.05)	(0.05)
Interaction of % Commercial units participating in on call service if available and FSRG				0.07	0.06
				(0.06)	(0.05)
Interaction of % of Multi-Family units with service available and FSRG				0.02	0.02
				(0.04)	(0.03)
Interaction of % of Multi-Family units with participating in service if available and FSRG				-0.14**	-0.10**
				(0.05)	(0.05)
Interaction of % of Single-Family units with service available and FSRG				-0.03	-0.02
				(0.04)	(0.04)
Interaction of % of Single-Family units participating in service if available and FSRG				0.11**	0.09**
				(0.05)	(0.04)
Interaction of Percentage of Residential Units that are Single-Family Units and FSRG				-0.15	-0.23*
				(0.13)	(0.12)
Constant	23.48***	38.12***	49.81***	-25.65	-58.40
	(1.70)	(1.89)	(7.82)	(152.34)	(149.45)
County FE	NO	YES	YES	YES	YES
Year FE	NO	YES	YES	YES	YES
Trimmed Data Set	YES	YES	YES	YES	NO
R-squared	0.05	0.59	0.61	0.65	0.67
Observations	848	848	848	846	1,055
Residential Units					
Percentage of Annual Payroll in Accommodation Industry	0.07	-0.26	-0.20	-0.14	-0.11
	(0.30)	(0.29)	(0.29)	(0.27)	(0.23)
Florida Statewide Recycling Goal (FSRG)	3.73**	3.13	-1.49	16.93	25.01
	(1.41)	(2.65)	(4.67)	(64.45)	(36.38)
Interaction of Accommodation and FSRG	0.24	0.35	0.34	0.24	-0.02
	(0.54)	(0.49)	(0.53)	(0.44)	(0.40)
Percentage of Annual Payroll in Goods Industry			-0.13	-0.12	-0.14*
			(0.09)	(0.08)	(0.07)
Percentage of Annual Payroll in Other Services Industry			-0.13*	-0.08	-0.11*
			(0.08)	(0.07)	(0.07)
Percentage of Annual Payroll in Public Sector Industry			-1.35	-1.53	1.15
			(2.90)	(3.47)	(2.71)
Interaction of Goods and FSRG			0.12	0.11	-0.01
			(0.15)	(0.12)	(0.09)

Interaction of Other Services and FSRG	0.04	0.03	0.06
	(0.06)	(0.07)	(0.06)
Interaction of Public Sector and FSRG	-39.48	-53.74	-73.29
	(82.15)	(83.48)	(79.94)
Real GDP Per 100,000 People (ln)		-16.35**	-11.05*
		(7.58)	(6.58)
Population in Thousands (ln)		-34.60***	-32.65***
		(12.45)	(10.92)
Total Commercial Units in County		-0.00	-0.00
		(0.00)	(0.00)
Total Number of Multi-Family Units in County		-0.00*	-0.00
		(0.00)	(0.00)
Total Number of Single-Family Units in County		0.00***	0.00***
		(0.00)	(0.00)
Average Number Residents Per Multi-Family Unit		0.12	0.06
		(0.22)	(0.20)
Average Number Residents Per Single-Family Unit		-0.00	-0.00
		(0.00)	(0.00)
% Commercial units w/ Scheduled Service available		-0.03*	-0.03**
		(0.01)	(0.01)
% Commercial units w/ On Call Service Available		-0.01	-0.02
		(0.02)	(0.02)
% Commercial units participating in scheduled service if available		0.08***	0.06***
		(0.02)	(0.02)
% Commercial units participating in on call service if available		-0.04**	-0.03
		(0.02)	(0.02)
% of Multi-Family units with service available		0.01	0.00
		(0.02)	(0.02)
% of Multi-Family units participating in service if available		-0.07**	-0.05*
		(0.03)	(0.03)
% of Single-Family units with service available		0.02	0.02
		(0.03)	(0.02)
% of Single-Family units participating in service if available		0.06**	0.05*
		(0.03)	(0.03)
Percentage of Residential Units that are Single-Family Units		-0.02	0.08
		(0.08)	(0.09)
Interaction of Real GDP Per 100,000 People (ln) and FSRG		-0.57	-0.21
		(4.23)	(2.43)
Interaction of Population in Thousands (ln) and FSRG		-0.17	-0.73
		(1.82)	(1.68)
Interaction of Total Commercial Units in County and FSRG		0.00	0.00
		(0.00)	(0.00)
Interaction of Total Number of Multi-Family Units in County and FSRG		0.00	0.00
		(0.00)	(0.00)
Interaction of Total Number of Single-Family Units in County and FSRG		-0.00	-0.00
		(0.00)	(0.00)
Interaction of Average Number Residents Per Multi-Family Unit and FSRG		0.91	0.93
		(0.75)	(0.86)
Interaction of Average Number Residents Per Single-Family Unit and FSRG		-1.29	-2.22
		(1.49)	(1.38)
Interaction of % Commercial units w/ Scheduled Service available and FSRG		0.04*	0.05**
		(0.02)	(0.02)
Interaction of % Commercial units w/ On Call Service Available and FSRG		0.02	0.02
		(0.02)	(0.02)

Interaction of % Commercial units participating in scheduled service if available and FSRG				-0.10***	-0.09**
				(0.04)	(0.04)
Interaction of % Commercial units participating in on call service if available and FSRG				0.03	0.03
				(0.02)	(0.02)
Interaction of % of Multi-Family units with service available and FSRG				-0.01	-0.01
				(0.04)	(0.03)
Interaction of % of Multi-Family units with participating in service if available and FSRG				0.06	0.08**
				(0.04)	(0.04)
Interaction of % of Single-Family units with service available and FSRG				-0.02	-0.01
				(0.03)	(0.03)
Interaction of % of Single-Family units participating in service if available and FSRG				-0.00	-0.02
				(0.05)	(0.04)
Interaction of Percentage of Residential Units that are Single-Family Units and FSRG				-0.02	-0.11
				(0.10)	(0.09)
Constant	19.41***	35.95***	49.35***	479.22***	381.61***
	(1.29)	(1.65)	(7.62)	(153.98)	(134.81)
County FE	NO	YES	YES	YES	YES
Year FE	NO	YES	YES	YES	YES
Trimmed Data Set	YES	YES	YES	YES	NO
R-squared	0.03	0.51	0.52	0.57	0.61
Observations	848	848	848	846	1,055