



Initial Evidence on the Association between Local Government Fiscal Distress and Environmental Protection Programs

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Abstract

The purpose of this study is to explore the commitment of local governments to environmental programs when fiscal distress is predicted. We hypothesize that commitment to environmental programs diminishes when the local government is experiencing fiscal distress. The regression model results indicate that local governments with high levels of debt were less likely to implement environmental programs and that a larger population and higher revenue are factors directly related to the commitment of local government to environmental programs. Communities that are more populous and less fiscally stressed are more likely to benefit from a local government that implements and sustains environmental programs. These results have implications for the stakeholders of local communities and broader implications for the global effort toward environmental protection and sustainable communities.

Keywords: *Environmental Protection, Fiscal Distress, Local Government, Sustainable Development*

Introduction

Local governments in the United States manage trillions of dollars of resources and are responsible for a substantial amount of waste and consumption. There is no question that local governments significantly influence economic, environmental and social equity outcomes in their communities. Social responsibility and sustainability efforts have become more common in the public sector and there seems to be a sincere global interest in the sustainability of local communities (ICLEI - Local Governments for Sustainability, 2015). Sustainability reporting and research has become a focal point

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for organizations around the world due to the increased attention on the environment, economic development and social justice issues ("Finding consensus: The 1992 Earth Summit and Agenda 21," 2012; Williams, 2015).

The concept of sustainable development has traditionally been linked to environmental protection issues and this remains a primary concern of the global community (Purdy, 2016; United States Office of Environmental Justice and Office of Sustainable Communities, 2010). In the past, waste management, conservation and water and air quality have been the focus of sustainable efforts for industry and local government (U.S. Environmental Protection Agency, 2016). This appears a legitimate concern because the quality and preservation of the environment have been a principal concern for citizens, academics, and politicians for decades (Arrow & Fisher, 1974; Carson, 2012; Herfindahl & Kneese, 1965; Portney, 2003).

There is scant research that investigates local government commitment to sustainable development in general, and more specifically, commitment to local environmental protection initiatives and local government fiscal distress. The relationship between stakeholder value and local government environmental initiatives is unclear. Results of sustainable development efforts at the local government level vary widely as does the reporting of those results. Similarly, in for-profit organizations, the relationship between shareholder value and sustainable development (i.e., Corporate Social Responsibility (CSR)) initiatives and the reporting of these initiatives, varies widely (Moser & Martin, 2012). Sustainable development research at the local government level is a critical component of overall sustainability research. The human, financial and natural resources that are consumed, produced and managed by local governments cannot be ignored (Lewis, 2000).

The purpose of this paper is to investigate the commitment of local governments in the South Atlantic Region of the United States to environmental protection initiatives when fiscal distress is predicted. To explore whether fiscal distress detracts from the implementation of environmental programs, data from a 2010 sustainability survey collected from local governments in the South Atlantic Region of the United States by the International City/County Managers Association (ICMA) is compared to seven financial variables suggested to predict fiscal distress in local governments (Trussel & Patrick, 2009).

This study has been structured as follows: section 2 provides background on the local government and sustainability literature. Section 3 discusses the research methodology and results of the analysis with section 4 reporting conclusions. Section 5 provides limitations and suggestions for future research.

Literature Review

Local government revenue and expenditures are a vital part of the U.S. economy. In 2012, state and local government collected 3.0 trillion of revenue and incurred expenditures in excess of 3.2 trillion dollars (Barnett & Vidal, 2010). The impact that state and local governments have on the environment cannot be overstated. There is a substantial amount of consumption and waste generated at the local level for which local government managers are responsible. Local government managers are also responsible for the management, administration and distribution of trillions of dollars

of resources used to fund public programs and provide public services and pay municipal debt (Trussel & Patrick, 2009).

Previous research in sustainable development identifies the Three E's (social equity, environmental protection and economic development) as the three fundamental goals of sustainable development in local government (Campbell, 1996; Lewis, 2000). Academics, policy makers and citizens have long recognized the importance of environmental protection concerns, because social equity and economic development issues depend on an environment that is healthy for citizens and conducive for business.

Prior research has investigated local government resolve toward sustainable communities. To determine what factors made some local governments take sustainability efforts more seriously than others, Portney (2003) developed an Index of Taking Sustainability Seriously and compares sustainable programs, policies and activities of 23 U.S. cities to determine the engagement of each city in such programs. Portney found that cities with a reliance on manufacturing were less likely to take sustainability seriously, and that cities with older populations took sustainability issues more seriously.

In 2004, Jepson collected responses from 103 cities regarding action taken related to sustainable development using 39 policies and techniques that are identified to support local sustainable development. He found that most communities focus on land development and land use planning at the expense of economic development and alternative energy development (Jepson, 2004). In addition, fiscal constraints were among the most common impediment for implementation of sustainable policy (Jepson, 2004).

A 2003 poll of local governments revealed that sustainability efforts were not considered an agenda item and that while familiarity with the concept exists, sustainable development remains a buzzword not firmly established as a priority (Conroy, 2006). A study reporting on Australian Local Councils sustainability reporting found that population, climate change and urban growth into mandated green space were primary sustainability considerations (Sciulli, 2011a), however accounting for sustainable reporting was not among the responsibilities of the accounting or finance department of local governments (Sciulli, 2011a; Williams, 2015).

More recent research investigates the extent to which local governments in the South Atlantic Region of the United States implement environmental, economic and social equity policies in their communities (Phillips and Strickland, 2015). The study found a significant and positive relationship between environmental policy variables and the action that local governments take related to environmental issues. There is increased pressure for local government to acknowledge the environmental impact it has on the larger community (Bellringer, Ball, & Russell, 2011; Sciulli, 2011b). There was a significant and positive relationship between environmental policies and implementing or sustaining environmental programs, but the reasons for this result are not clear. Implementing and sustaining environmental programs may be an expectation of the citizenry, or a part of the community culture. However, the environmental action of local government may also reflect the desire of local government managers to advance their political career, achieve self-legitimation, demonstrate accountability to

constituents, or improve financial outcomes for the community (Bellringer et al., 2011).

Trussel and Patrick (2013) developed and tested a model to investigate the relationship between fiscal distress and reduction in public services. They found that a high level of intergovernmental revenues relative to total revenues was the most important signal of impending reduction of public services. Typically, municipalities will attempt to avoid fiscal distress by taking steps to reduce administrative expenses or by increasing taxes before public services are reduced. Public services include a wide variety of conveniences such as water supply, trash collection, education and recreation. The impact of fiscal distress on overall environmental protection strategies have not yet been identified although environment is considered a primary concern of the citizenry, legislators, and local administrators ("Environmental Challenges," 2016; National League of Cities Sustainable Cities Institute, 2016a; Purdy, 2016; United States Department of Transportation, 2012).

Prior research has not examined the relationship between potential fiscal distress and the implementation and continuation of environmental programs. Programs and policies that promote sustainable efforts, for example, recycling, water quality, pollution, energy efficiency (i.e. the purchase of electric vehicles or solar equipment) mass transit, bike lanes, land conservation programs and affordable housing require financial resources yet program funding is not clearly identified in the Comprehensive Annual Financial Reports (CAFR) of most local governments (Phillips and Strickland, 2015). Per the International City/County Managers Association (ICMA) survey of local governments, a mere 14% of local governments indicate that they have a budget developed for sustainability programs.

Prior research has examined the relationship of Corporate Social Responsibility (CSR) with financial performance of for-profit corporations where CSR reporting is more transparent. The contention is that in order for investments in "green technology" to maximize shareholder value, the costs must be less than the benefits (Moser & Martin, 2012). However, these benefits may be intangible in the form of enhanced reputation, greater employee satisfaction and decreased regulation. CSR activities were in fact suggested to lead to improved financial results attributed to the improved reputation of a corporation (Dhaliwal, Radhakrishnan, Tsang, & Yang, 2012). Specifically, the improved reputation corporations enjoy from engaging in and reporting CSR activities were suggested to increase sales, attract high quality employees, motivate existing employees, and result in treatment that is more favorable from regulators. Results of another study found that corporations investing in more CSR initiatives were less likely to engage in earnings management or fraudulent financial reporting (Kim, Park, & Wier, 2012). This was interpreted to suggest that managers more likely to engage in ethical CSR initiatives (i.e., those more likely to add to shareholder value) were less likely to manage earnings.

Local governments' commitment to environmental protection activities could be measured by a willingness to continue to adopt policies and engage in activities despite fiscal distress. Trussel and Patrick (2009) developed a model to predict fiscal distress in local governments. Results suggest the characteristics of fiscally distressed local governments are those with higher levels of debt, more intergovernmental revenues, lower administrative expenses, and less growth in revenues compared to

local governments that are not fiscally distressed. There are regulations in place to protect the environment, to safeguard economic position and protect vulnerable citizens. However, many environmental initiatives are undertaken by local government mostly on a voluntary basis. The motivation for initiating these programs, at least in the United States remains unclear.

There has been increased pressure on local government managers to recognize the direct and indirect bearing they have on national environmental matters, questions of economics and social justice issues (Grubnic & Ball, 2007; United Nations, 2016). Perhaps it is the repeated emphasis on the importance of state and local government as strategic actors in the effort toward overall sustainable development. The future of sustainable development may be reflected in a business model that is emerging. The model includes "...government, business, investors and the civil society to gather to solve global problems" (United Nations Department of Economic and Social Affairs, 2014).

It is possible that local government administrators engage in sustainable initiatives, like environmental protection activities, because it is viewed as a necessary step to assuage constituents, manage reputational credibility or impress the City Council or the appropriate authoritative body. The administrators or politicians may aspire to a higher-level position, pay increase, re-election or a promotion to a more desirable local government. Establishing a reputation for implementing and sustaining environmental programs could be beneficial to the reputation of the administrator or politician.

The trend toward sustainable urbanism is growing (National League of Cities Sustainable Cities Institute, 2016b; United Nations, 2016). There is an increased interest in sustainable development at the local government level as a part of an overall demand from internal and external stakeholders for more transparency and disclosure of public sector operations (Adams, Muir, & Hoque, 2014). Whether local government managers are initiating green programs out of genuine concern or for other reasons remains to be determined. In either case, local governments serve in a critical and increasingly important role, as they are accountable for the environmental, economic and social equity issues in every community.

Measuring the commitment of local governments to creating and maintaining livable communities by undertaking environmental initiatives is a reasonable goal. One logical technique to measure the commitment of local governments to environmental initiatives is to examine the funding that is dedicated to environmental spending. However, there is no consistency among local entities in reporting sustainability type expenditures (Lauesen, 2013). The Comprehensive Annual Financial Report (CAFR) of local governments in the United States do not generally differentiate sustainable development expenditures from other expenditures. This is not to say that the local governments are not funding environmental efforts because clearly, local governments are receiving federal grants and spending tax dollars in support of environmental protection (United States Department of Transportation, 2012). However, spending is not clearly identified in the CAFR's as supporting environmental protection in spite of the global effort to promote green practices (Gleckman, 2015).

Another means to analyze local governments' financial commitment to environmental protection is to examine whether local governments that are experiencing fiscal distress are less likely to participate in environmental initiatives. This investigation

would be especially pertinent given the recession that resulted from the mortgage crisis in 2008 because local governments experienced an overall decrease in total revenue and a significant increase in expenditures and debt (Barnett, 2015). A relationship between environmental protection expenditures and fiscal stability would suggest environmental protection is a luxury that fiscally stressed local governments cannot afford.

Environmental issues are frequently the centerpiece of sustainable development initiatives. This may be because the environment is a compulsory element of economic development and social equity. It may also be a residual effect of the longevity with which the concept of environmental protection has existed. Prior research found a relationship between environmental policy and action variables and population, geographic area and form of government (Phillips & Strickland, 2015). As a result of the prevalence of environmental policy and action taken by local government, this study focus's on environmental policy and action variables to determine if fiscal distress reduces environmental programs.

Methodology

Sustainability Variable Definition

To represent the commitment of the local government to sustainability, this study utilizes standard data gathered from local governments using a survey conducted in 2010 by the International City/County Managers Association (ICMA). The instrument includes questions about local government sustainability policies and programs to measure local government commitment to sustainable development. The survey was distributed to 2,696 local governments (counties and cities) across three regions, the South Atlantic, East South-Central and West South-Central and 625 local governments responded for a response rate of 23.2%. The data for this study are the cumulative responses of independent local governments in these regions of the U.S.

The ICMA survey is composed of 26 numbered questions. *Policy variables* were identified from question 1 and *action variables* were identified from the remaining questions. *Policy variables* request that local governments rate their level of commitment to sustainable development while *action variables* measure the number of sustainable development programs implemented.

Prior research suggests that the local governments in the South Atlantic Region of the United States (Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia, and District of Columbia) were more apt to place priority on environmental programs (Phillips & Strickland, 2015). The current study investigates the commitment of local government to sustainable efforts when fiscal distress exists, and therefore utilizes data from the South Atlantic Region, known to implement environmental programs. This is a reasonable limitation in scope to investigate whether fiscal distress is related to a decrease in the effort of local governments to support environmental programs.

Environmental action questions (ENV ACT) represented the overwhelming majority of the data provided by the ICMA local government sustainability survey (Appendix

II). Environmental action variables were represented by 19 of the 25 questions used (76%).

The questions in the survey were in one of four formats: yes or no, check all applicable, check only one, and an open-ended response. Some modifications were required to standardize the data to facilitate a statistical analysis. Responses to the yes or no format in the data were coded in the raw data as 1 for yes and 2 for no; yes being a favorable choice. These questions were recoded 1 for yes and 0 for no to be consistent with the remaining questions where a higher number was a favorable response. The check all applicable needed no modification as lettered items under the sub-heading in the survey require a response of 1 for the establishment of the program and 0 in the absence of a program. As a result, the maximum score for each lettered line item is 1.

In questions 11 and 24, the response options offered more than one choice for each lettered item. For these two questions, data were modified to limit each line item to a response that would not exceed 1. (Where there were two choices per line item each was 0 or 0.50, where there were three choices per line item each item was 0.33). Question number 3 was the only open-ended question and had few responses so it was eliminated from the analysis.

The environmental action (ENV ACT) variable was an average of the individual responses of the local governments to the survey in a raw, by respondent, data base format. Responses are a dichotomous variable with 1 for yes, we have the program, and 0 for no we do not. Thus, the variable could range from 1.0 where local governments chose yes to implementation of all environmental programs to 0 for those answering no to each question. ENV ACT represents the degree to which the local governments practice sustainable development as measured by the implementation of environmental programs.

Financial Independent Variable Definition

To depict the existence of fiscal distress in local governments, financial data were hand collected from the 2010 Comprehensive Annual Financial Reports (CAFR) of each local government for whom survey data was collected in the South Atlantic Region of the United States.

Variables depicting fiscal stress were selected from a model developed by Trussel & Patrick (2009) that analyzed local Pennsylvania governments. The model identified seven independent variables significant in the explanation of a parsimonious dependent variable, yes or no, to the question of fiscal distress. There was a 91% success rate experienced in predicting fiscal distress using these variables. The seven variables suggested to be predictors of fiscal distress are included in Table 1.

Table 1
Risk Factors of Fiscal Distress and their Expected Relation with Distress

| Hypo-thesis # | Indicator | Measure | Expected Relationship to Fiscal Distress | Expected Relationship to ENV ACT |
|-------------------------------|-----------------------------------|--|--|----------------------------------|
| Revenue Concentration: | | | | |
| 1 | Taxes to Revenue (TAXREV) | $\frac{\text{Tax Revenue}}{\text{Total Revenue}}$ | + | - |
| 2 | Inter-governmental Revenues (IGR) | $\frac{\text{Revenue from Federal and State}}{\text{Total Revenue}}$ | + | - |
| Expense Concentration: | | | | |
| 3 | Administrative Cost Ratio (ADMIN) | $\frac{\text{Administrative Expenditures}}{\text{Total Expenditures}}$ | - | + |
| Debt Levels: | | | | |
| 4 | Debt Level (DEBT) | Total Liabilities | + | - |
| 5 | Debt to Revenue (DEBTREV) | $\frac{\text{Total Liabilities}}{\text{Total Revenue}}$ | + | - |
| Relative Size: | | | | |
| 6 | SIZE (SIZE) | Total Revenue | - | + |
| 7 | Revenue Growth (GROWTH) | $\frac{\text{Total Revenue} - \text{Total Revenue } t-1}{\text{Total Revenue } t-1}$ | - | + |

Trussel, J.M. and P.A.Patrick, 2009., A Predictive model of fiscal distress in local governments, *Journal of Public Budgeting, Accounting and Financial Management* 21 (4): 578 - 616.

Hypotheses Development

To explore whether fiscal distress detracts from the implementation of environmental programs, the seven financial variables, shown in Table 1, were examined in relation to the degree to which each local government implements environmental programs measured by ENV ACT.

Revenue concentration is the first financial measure suggested as predictor of fiscal distress by Trussel & Patrick (2009). The first of two measures of revenue concentration identified is the extent to which local government depend on tax revenue. Local governments relying more heavily on taxes were found to be more likely to experience fiscal distress. This is distinct from local governments receiving support from other more creative sources (e.g., permits, licenses, grants, contributions, charges for services and investment income) because such governments were found to be less likely to experience fiscal distress. This aspect of revenue concentration was

measured by expressing tax revenue as a percentage of total revenue (TAX REV). This study will explore whether these less fiscally stable local governments will be less likely to participate in environmental programs. Since this variable was previously found to be directly related to fiscal distress, the following hypothesis (*in alternative form*) was developed:

H1: Local governments with higher TAXREV (a predictor of fiscal distress) are less likely to implement environmental programs. An indirect relationship is predicted.

Support from other governments (i.e., state or federal governments) is the second measure of revenue concentration suggested to be related to fiscal distress. Local governments with a strong reliance on support from other governments were suggested to be more likely to experience fiscal distress by Trussel & Patrick (2009). Also, a higher level of intergovernmental revenues relative to total expenses was the most important signal of impending reduction in of public services (Trussel & Patrick 2013). The variable of “intergovernmental revenue” or “IGR” was measured by expressing the revenue the local government receives from federal and state governments as a percentage of total revenue. Since this variable was also previously found to be a direct predictor of fiscal distress, the following hypothesis (*in alternative form*) was developed:

H2: Local governments with higher IGR (a predictor of fiscal distress) are less likely to implement environmental protection programs. An indirect relationship is predicted.

The categories of expenses paid by local governments were the next measure found to be a predictor of fiscal distress by Trussel & Patrick (2009). Results of this previous study suggest local governments with higher levels of administrative or discretionary, nonessential expenses are *less* likely to experience fiscal distress. These administrative expenditures contrast with the absolute essentials of both debt service and programmatic costs. Local governments in fiscal distress could not meet their required costs as well as more dispensable administration costs. This study will explore whether these more fiscally stable local governments will be more likely to participate in environmental programs. ADMIN is measured by administrative expenses expressed as a percentage of total expenses. The following hypothesis (*in alternative form*) was developed to test this contention:

H3: Local governments with higher ADMIN (a predictor of LESS fiscal distress) are more likely to implement environmental programs. A direct relationship is predicted.

Local governments with high levels of debt were suggested to experience fiscal distress because they have less flexibility and are burdened with required debt service payments (Trussel & Patrick, 2009). Higher levels of debt impede opportunities to raise funds from capital markets because they have a higher default risk. Two financial measures were used to represent oncoming fiscal distress as predicted by increased levels of debt. The first variable, DEBT, is measured by the natural logarithm of total liabilities and the second is the ratio of total liabilities to revenue or DEBTREV. The following two hypotheses (*in alternative form*) were developed:

H4: Local governments with higher DEBT (a predictor of fiscal distress) are less likely to implement environmental protection programs. An indirect relationship is predicted.

H5: Local governments with higher DEBTREV (a predictor of fiscal distress) are less likely to implement environmental protection programs. An indirect relationship is predicted.

Entity resources balanced with the needs of local governments were suggested by Trussel and Patrick (2009) to predict the possibility of fiscal distress. Local governments with a higher tax base were found to be less likely to experience fiscal distress because they have access to additional resources. Conversely, those with a smaller tax base are required to do more with less because they cannot overburden the limited group of tax payers available. The size of the tax base represents the level of resources and is captured using the natural logarithm of total revenue or SIZE.

Some smaller local governments were eliminated from the sample because financial data was not available. Specifically, 185 local governments were included in the original sample; data gathering efforts were successful for 105. This did not, however, eliminate the diversity within the sample regarding local government size. As will be shown in the descriptive statistics of the sample of local governments, there is still tremendous diversity within the sample in terms of size -- the population size of local governments ranges from 28,000 to 1.6 million.

In addition to the level of resources, it is necessary to consider the change of the resources of the local government or GROWTH to properly consider the impact of entity resources. This was measured by Trussel and Patrick (2009) using the change in current revenue over previous year revenue expressed as a percentage of previous year revenue. An increase in the tax base depicts a favorable situation and therefore less fiscal distress is expected.

The following two hypotheses (*in alternative form*) were developed to address entity resources:

H6: Local governments of larger SIZE (a predictor of LESS fiscal distress) are more likely to implement environmental protection programs. A direct relationship is predicted.

H7: Local governments with higher GROWTH (a predictor of LESS fiscal distress) are more likely to implement environmental protection programs. A direct relationship is predicted.

Previous research indicated that local governments of large size measured by population (POP) were a significant predictor of the implementation of environmental programs (Phillips and Strickland 2015). Thus, an additional variable of population size (POP) was examined for significance to implementation of environmental programs.

H8 (*in alternative form*): Larger local governments (depicted by higher levels of population) are more likely to implement programs in environmental protection. A direct relationship is predicted.

Discussion of Results

Descriptive statistics were computed for the dependent variable environmental action (ENV ACT), the seven financial variables and POP for each local government (Table

Table 2
Descriptive Statistics

| | N | Minimum | Maximum | Mean | Std.Deviation |
|--------------------|-----|---------|-----------|---------|---------------|
| ENV ACT | 105 | 0.0628 | 0.5958 | 0.30125 | 0.1255091 |
| POP | 105 | 28,547 | 1,623,018 | 206,698 | 274,567 |
| TAXREV | 105 | 0.1 | 0.8 | 0.498 | 0.1776 |
| IGR | 105 | 0 | 0.9 | 0.154 | 0.111 |
| ADMIN | 105 | 0 | 0.3 | 0.11 | 0.072 |
| DEBT | 105 | 8.3 | 15.9 | 12.24 | 1.4839 |
| DEBTREV | 105 | 0 | 6.4 | 1.377 | 1.0432 |
| SIZE | 105 | 9.6 | 15.2 | 12.188 | 1.1258 |
| GROWTH | 105 | -0.5 | 1.8 | 0.05 | 0.3004 |
| Valid N (listwise) | 105 | | | | |

2).

Next, a multivariate model was estimated to describe ENV ACT, the dependent variable. The backward elimination procedure was used to simplify and standardize the search for the “best” set of independent variables to accomplish this (Berenson et al., 1983). This process starts with the complete regression model including all possible independent variables and then eliminates the variable with the smallest incremental contribution at each step measured by the least significant p-value.

Specifically, the first equation contained all eight independent variables. Eliminating the least significant variable and re-estimating the equation with the remaining variables resulted in the removal of five variables in the following order; IGR, TAXREV, ADMIN, DEBTREV, and GROWTH. The remaining equation included SIZE, POP and DEBT explaining ENV ACT with an adjusted r^2 of 28%. While the independent variable of DEBT has the least significant p-value of 0.087, it does add explanatory value to the equation.

To examine for multicollinearity between independent variables, the Variance Inflation Factor (VIF) and tolerance were computed for each independent variable. The most common rule of thumb for a multicollinearity threshold was ten (O’Brien 2007). Since the VIF levels for all three independent variables were within this range, multicollinearity was not considered a factor in the estimation of the equation. Results are shown in Table 3.

From the multivariate model explaining ENV ACT, local governments of larger SIZE and larger POP (both predictors of LESS fiscal distress) were considered more likely

Table 3
Multivariate Model - Environmental Action

| | β | t | p-value | Collinearity Statistics | |
|---------------------------|---------|--------|---------|-------------------------|-------|
| | | | | Tolerance | VIF |
| Constant | | -1.991 | 0.049 | | |
| POP | 0.248 | 2.502 | 0.014 | 0.695 | 1.439 |
| DEBT | -0.273 | -1.727 | 0.087 | 0.274 | 3.649 |
| SIZE | 0.596 | 3.77 | 0.000 | 0.274 | 3.649 |
| Model Adjusted R2 = 0.281 | | | | | |

to implement environmental programs. The positive sign of each of these variables suggests a direct relationship. Local governments with higher levels of DEBT (a predictors of MORE fiscal distress) was considered less likely to implement environmental programs. The negative sign of this variable suggests the indirect relationship that was expected. See a summary of the outcome of hypotheses testing included in Table 4.

Table 4
Summary of Results

| Hypothesis Number | Variables | Hypotheses (stated in the alternative) | Results |
|--------------------------|--------------------|---|--|
| 1 | ENV ACT TAXREV | Local governments with higher TAXREV (a predictor of fiscal distress) are less likely to implement environmental protection programs – an indirect relationship is predicted. | Failure to reject null hypothesis – no relationship between TAXREV and ENV ACT |
| 2 | ENV ACT IGR | Local governments with higher IGR (a predictor of fiscal distress) are less likely to implement environmental protection programs – an indirect relationship is predicted. | Failure to reject null hypothesis – no relationship between IGR and ENV ACT |
| 3 | ENV ACT ADMIN | Local governments with lower ADMIN (a predictor of fiscal distress) are less likely to implement environmental protection programs – a direct relationship is predicted. | Failure to reject null hypothesis – no relationship between ADMIN and ENV ACT |
| 4 | ENV ACT DEBT | Local governments with higher DEBT (a predictor of fiscal distress) are less likely to implement environmental protection programs – an indirect relationship is predicted | Reject null hypothesis. DEBT emerged as a significant independent variable in the estimation of ENV ACT in a multivariate equation. The coefficient has a negative sign which suggests an indirect relationship. |
| 5 | ENV ACT DEBTREV | Local governments with higher DEBTREV (a predictor of fiscal distress) are less likely to implement environmental protection programs – an indirect relationship is predicted. | Failure to reject null hypothesis – no relationship between DEBTREV and ENV ACT |
| 6 | ENV ACT SIZE | Local governments with smaller SIZE (a predictor of fiscal distress) are less likely to implement environmental protection programs – a direct relationship is predicted | Reject null hypothesis. SIZE (the natural logarithm of total revenue) emerged as a significant independent variable in the estimation of ENV ACT in a multivariate equation. The positive sign of the coefficient suggests local governments of greater size, less fiscal distress, are more likely to implement environmental programs. |
| 7 | ENV ACT GROWTH | Local governments with higher GROWTH (a predictor of LESS fiscal distress) are more likely to implement environmental protection programs – a direct relationship is predicted. | Failure to reject null hypothesis – no relationship between GROWTH and ENV ACT |
| 8 | ENV ACT POP | Local governments of smaller size measured by population (POP) are less likely to implement environmental protection programs – a direct relationship is predicted. | Reject null hypothesis. POP emerged as a significant independent variable in the estimation of ENV ACT in a multivariate equation. The positive sign of the coefficient suggests local governments of greater size, measured by population, are more likely to implement environmental programs. |

Conclusion

The current research explores new ground as the goal was to link local government environmental program activity to financial results. Local governments do not present financial information in a format that discloses specific funds spent on environmental initiatives. Thus, a different approach was necessary; this study examines the relationship between fiscal distress factors (Trussel & Patrick, 2009) and the implementation or continuation of local government environmental protection programs. Previous research has indicated that local governments do implement programs to support the sustainable development policies they espouse (Phillips & Strickland, 2015). In terms of for-profit companies, results of several studies indicated that higher levels of corporate social responsibility led to improved financial results, improved corporate reputations and a decrease in the incidence of fraud (Dhaliwal et al., 2012; Kim et al., 2012; Moser & Martin, 2012).

Overall, the results suggest that the connection between the possible fiscal distress of a local government to diminished execution of environmental programs seems to be associated with the size of the local government and the level of debt.

Size seems to be a substantial factor in explanation of higher level of environmental initiatives as it emerged as significant measured by total revenue and population. Revenue was expected to have direct relationship to environmental programs because governments with a larger tax base were found to be less likely to experience fiscal distress as they have access to additional resources. Conversely, those with a smaller tax base are required to do more with less because they cannot overburden the limited group of tax payers available.

Size of local governments was further affirmed as an explanatory factor in the implementation of environmental programs by the significance and positive sign of population, an additional measure of the tax base of local governments. Previous research indicated that local governments of large size measured by population size were a significant predictor of the implementation of environmental programs (Phillips & Strickland, 2015).

The association between the size (measured by revenue and population) of a local government and environmental action could reflect a local government that is acting because it is aware of the community benefits of environmental programs. Financially supporting environmental programs to improve the condition of the community signals good stewardship to constituents. This is positive reinforcement for local government manager's reputation and possible re-election. Perhaps the larger population and larger tax base reflect older and more established local governments that have environmental protection programs firmly established as a part of the community culture, or the expectations of the community are clear regarding environmental action.

More debt-ridden local governments and those of smaller size were found to be less likely to implement environmental programs. The degree of debt, a category of fiscal distress measured by the natural logarithm of total liabilities, emerged as being associated with a lower likelihood of implementing environmental programs. This is consistent with previous research as local governments with high levels of debt were suggested to experience fiscal distress because they have less flexibility and are

burdened with required debt service payments (Trussel & Patrick, 2009). Higher levels of debt impede opportunities to raise funds from capital markets because of a higher default risk.

The lack of association between environmental action and high intergovernmental revenues as a percent of total revenue, administrative expense as a percent of total expense, growth, and the ratio of total liabilities to revenue suggests that other factors are at work regarding local governments and environmental protection programs. In Trussel and Patrick (2013) these variables were positively associated with a reduction of public services. It seems likely that if environmental programs are not being financially supported through normal revenue streams. One potential explanation is that local governments are utilizing federal or state grants to implement and sustain environmental programs.

Limitations and suggestions for future research

This research investigates the association between seven factors of fiscal distress and the environmental programs implemented by local governments in the South Atlantic Region of the U.S. While this research was successful in highlighting an association with environmental program implementation and the size and debt levels of local governments, there were several limitations that could be addressed in future research.

The current study examined the financial condition in the same year as the environmental programs were implemented. It might be appropriate to lag the predication of fiscal distress a year or two behind the implementation of environmental projects. Since the hand collection of this data was a time consuming and onerous task, the purchase of a data base could facilitate a more efficient data-gathering process. In addition, this study uses local governments in the South Atlantic Region of the U.S. and these results may not be generalizable to other areas of the country or the world. Future research could expand the dataset to include local governments in other regions and countries.

Responses to the survey were self-reported by local government managers. While there is no reason to doubt the accuracy of the responses, they may not precisely reflect the environmental policy and actions taken by the respondent government. In addition, the survey is limited to one geographical area in the United States and therefore may not be generalizable to other local governments.

Future research in local government sustainable development could examine the relationships discovered between debt, size and environmental programs more closely. In addition, the degree which resources are provided for economic and social equity programs is worthy of investigation because these are an important component of overall sustainability effort. Finally, if local governments are dependent on federal grant dollars to support environmental initiatives an investigation into the types of grants and the characteristics of local governments utilizing the grant opportunities would provide useful information to local governments and other stakeholders.

Our study enhances the current literature on local government sustainability in three important ways. First, there is no prior research that investigates the association between environmental practices of local government and fiscal distress. The lack of

research in this area is surprising given the amount of consumption and waste generated by local governments. Second, we add to the current literature regarding the potential consequences of fiscal distress. Finally, the implementation and longevity of environmental programs are of concern to local government administrators, the citizenry, legislators, creditors and other stakeholders because of the long term affect that environmental programs have on local communities.

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