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John Dove,

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The relationship between local government economic freedom and bond ratings

Economic
freedom and
bond ratings

435

John Dove

*Manuel H. Johnson Center for Political Economy, Troy University,
Troy, Alabama, USA*

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Abstract

Purpose – With a newly developed measure of economic freedom across US local government jurisdictions, this paper aims to estimate the relationship between economic freedom and bond ratings.

Design/methodology/approach – The author uses a battery of cross-sectional econometric models to identify the impact that economic freedom might have on bond ratings using a sample of US municipal governments.

Findings – Overall, the results indicate that relatively more economic freedom within a local jurisdiction is associated with higher bond ratings and thus lower borrowing costs. However, similar to Roychoudhury and Lawson (2010), no specific subcomponent seems to affect bond ratings.

Originality/value – To the author's knowledge this is the first scholarly work to address this topic at the local level.

Keywords Debt, Debt management, Cross-sectional models, Structure and scope of government

Paper type Research paper

1. Introduction

There is a well-established literature which evaluates the link between economic freedom and multitudes of socio-economic and institutional performance across a number of jurisdictions (Berggren, 2003; Hall and Lawson, 2014 and Section 2 for a more developed literature reviews). An additional and important strand within this literature has compared how various national and subnational government jurisdiction's bond ratings are affected by economic freedom (Biglaiser and Staats, 2012; Belasen *et al.*, 2015; Roychoudhury and Lawson, 2010; Calcagno and Benefield, 2013). This has been undertaken through cross-country comparative studies and also state-level studies applied specifically to US states. Overall, this research has indicated a strong and positive correlation between economic freedom and bond ratings as reported by the major ratings agencies of Moody's, Fitch and Standard & Poor's (S&P).

This current study adds to this latter literature by addressing a similar question at the municipal level using data from a sample of local governments within the USA and a newly created measure of local government economic freedom, to be discussed in greater detail below, along with bond ratings from the above-mentioned ratings agencies. Overall the results, which are robust to a number of specifications, indicate that municipal bond ratings are in fact positively correlated with greater economic freedom.



Overall, this research question is important for several reasons. First, since the financial crisis of 2008, there has been a renewed academic interest in the fiscal solvency of state and local governments. One effect of the crisis was an increase in fiscal stress on state and local public finances. These problems culminated with defaults by such cities as Detroit, MI and Stockton, CA. Bond rating agencies have also taken notice of these issues and responded accordingly.

In this light then and related to economic freedom, it should be the case that greater economic freedom results in more stable and growth enhancing outcomes. This should serve as both a credible commitment by a public jurisdiction regarding its adherence to the protection of property rights and to also pursuing more long-run and time-consistent public policy. As will be discussed in the following section, greater economic freedom has been shown to be positively associated with greater economic growth. This would suggest that greater entrepreneurial activity and business formation occurs in those locations and with it increased potential revenue for a local jurisdiction. Thus, greater economic freedom should lead to a more robust local economy, which may be associated with more stable public policy.

Further, through jurisdictional competition, those jurisdictions that provide for greater protection of property rights among other factors should see population inflows, which would also tend to convey important and positive economic signals to bond rating agencies. Evidence of such migratory effects have been found at the state level (Ashby, 2007). Overall then, it should be the case that as economic freedom increases within a particular local jurisdiction it should, *ceteris paribus*, be positively associated with higher bond ratings and thus lower borrowing costs. The remainder of the paper is dedicated to testing this hypothesis and is structured as follows: Section 2 provides a brief review of the relevant literature and several theoretical considerations based on those considerations. Section 3 details the data used and model specification. The results are laid out and discussed in Section 4, whereas Section 5 concludes.

2. Literature review

A large and robust literature has developed detailing the exact effects that economic freedom has on various socio-economic and institutional outcomes. This includes the relationship between economic freedom and economic growth (Justesen, 2008; Carlsson and Lundstrom, 2002; Dawson, 2003; De Haan and Sturm, 2000; Faria and Montesinos, 2009), as well as entrepreneurship (Nyström, 2008; Bjørnskov and Foss, 2008), and other factors. These studies along with numerous others have consistently shown a positive relationship between economic freedom and economic outcomes at the international level. Additional work has addressed similar questions regarding economic growth, entrepreneurship and income inequality but using lower-level jurisdictions (typically US states) (Kreft and Sobel, 2005; Ashby and Sobel, 2008; Campbell and Rogers, 2007; Compton *et al.*, 2011).

The current paper adds to a growing literature that considers how bond ratings might be affected by changes in various components of economic freedom. At the international level, Biglaiser and Staats (2012) use data from the *Economic Freedom of the World* (EFW) index compiled annually by the Fraser Institute. Specifically, these authors use economic freedom subcomponent scores that represent “Judicial Independence”, “Impartial Courts” and “Protection of Property Rights”. The findings clearly indicate both a statistically and economically significant and positive effect for these variables and the influence they have on sovereign bond ratings.

Additional work more closely linked to this current study evaluates how broader measures of economic freedom might influence bond ratings both internationally and within

the USA at the state level (Roychoudhury and Lawson, 2010; Calcagno and Benefield, 2013; Belasen *et al.*, 2015). Here, these latter two papers use similar approaches, though evaluating different sample ranges and controlling for slightly different factors. Overall, each of these articles arrives at similar conclusions: greater economic freedom is positively associated with increased bond ratings. The current paper draws on this research and contributes to the literature by extending the analysis further. Specifically, I apply a newly developed index of economic freedom at the US municipal level created by Stansel (2013), which is based on both the EFW and *Economic Freedom of North America* (EFNA) indices as compiled by the Fraser Institute. This measure of municipal economic freedom is then applied to evaluate how economic freedom might influence bond ratings for a sample of US municipalities.[1]

Finally, the current work can also be placed within a broader literature that has addressed various factors which may influence bond ratings, generally at the state level within the USA. This work includes analyses of judicial independence (Dove, 2017), corruption (Depken and Lafountain, 2006), state auditors (Schelker, 2012), fiscal institutions including tax and expenditure limits, balanced budget rules, and debt restrictions (Johnson and Kriz, 2005) and various economic characteristics in general (Liu and Thakor, 1984). Overall these scholarly works find that higher bond ratings are associated with greater judicial independence, lower levels of public corruption, strict term limits on state auditors, expenditure limits, relatively strict balanced budget rules and limits on debt issuance, whereas revenue limits tend to be associated with lower bond ratings and thus higher borrowing costs.

Given the above discussion, it is important to understand how economic freedom might affect municipal bond ratings. First, given that more economic freedom is tied to greater rates of entrepreneurship, business startups and increased economic growth, this would suggest that a municipal government would be able to take on a relatively larger debt load and more easily meet the obligations associated with those burdens. Further, Hafer (2012) indicates that at least at the international level, economic freedom is tied to greater and more sophisticated financial development. To the extent that this holds at the municipal level, this should also tend to improve bond ratings. Finally, jurisdictional competition should also drive productive resources to jurisdictions where there is greater opportunity for them to be constructively used, which should increase economic growth and development within that locale. These factors, along with those discussed above should all culminate in a positive relationship between economic freedom and local bond ratings.

3. Data and model description

The variables used in this study come from a number of sources. The main independent variable of interest is taken from Stansel (2013) who created an economic freedom index for 384 metropolitan areas within the USA. These include 355 metropolitan statistical areas (MSAs) and 29 metropolitan divisions. The municipal index follows closely the composition and calculation used for the EFNA index compiled by the Fraser Institute[2]. The index is based on a ten-point scale, with a low of “0” and high of “10”. Data for the municipal economic freedom index were compiled from US Census data for 2002, which was the most recently available year that could be obtained for the study. Thus, the analysis within this current study is cross-sectional in nature, given the lack of municipal economic freedom data for any other years.

The dependent variable is the bond rating from each of the main rating agencies of Moody's, Fitch and S&P. This information was also compiled from US Census data, which provided bond ratings for the largest 79 US municipal governments by population between

1995 and 2010[3]. In using bond ratings there are two issues that arise that need to be addressed. First, all three rating agencies apply letter-based rating systems, and second each rating agency uses a different range of letters. To overcome these problems and to obtain a quantifiable and interpretable result, I follow [Depken and Lafountain \(2006\)](#) and normalize each bond score.

Specifically, Fitch and S&P use ratings from a high of “AAA” down to a low of “C” with “+” and “-” applied through these ranges, whereas Moody’s uses a scale between a high of “AAA” down to a low of “C” with “1”, “2” and “3” applied through the range. This leaves a total of 19 distinct ratings for Fitch, 25 ratings for S&P and 21 ratings for Moody’s. Therefore, to normalize these ratings, I apply a numerical value to each municipal rating for each agency and divide by the total number of possible ratings for each agency, with the highest value accompanying the highest rating[4]. This provides a normalized score between “0” and “1” for each rating agency. These three separate scores are then averaged into one combined normalized bond score, which is used as the dependent variable[5].

[Figure 1](#) displays the averaged normalized bond score for each municipal government used in this analysis.

Importantly, this figure indicates significant variation in bond ratings across municipalities. To empirically evaluate the relationship between economic freedom and bond ratings, I use the following model:

$$Rating_i = \alpha + EF_i' \beta + X_i' \delta + \varepsilon_i \quad (1)$$

Given that the normalized-dependent variable is censored between “0” and “1”, OLS may not be an appropriate estimation strategy. Thus, the empirical strategy uses a Tobit model to account for the censored nature of the data. Further, $Rating_i$ is the averaged normalized bond rating for municipality i , EF_i is the overall economic freedom score for municipality i , whereas X_i is a vector of socioeconomic and institutional control variables that may influence a municipality’s bond rating and which are consistent with the literature ([Liu and Thakor, 1984](#)). [Table I](#) provides the summary statistics for all of the variables included in the analysis.

Specifically, I include control variables for the poverty rate within a municipality, per capita income, median age, homeownership rates, per capita debt and public corruption convictions per 100,000 citizens. I also include three institutional constraints which are the existence of the local initiative, local recall and local home rule each coded as a “1” if the institution exists and “0” otherwise. Here, as poverty rates increase, this may result in greater fiscal stresses placed upon a municipal government, which should result in lower bond ratings. Further, an increase in per capita incomes should lead to increased potential tax revenue, which may be especially important in times of fiscal stress. Thus, per capita income should have a positive effect on bond ratings. Conversely, an older population may have a reduced potential to earn income and thereby increase the tax base while simultaneously requiring more public support. Thus, median age should be negatively correlated with bond ratings.

Additionally, homeownership rates are correlated with a larger property tax base which is especially important for municipal governments. Thus, as homeownership rates increase, this should also increase municipal bond ratings. Further, a larger debt burden may decrease the long-term fiscal outlook of a municipal government and would thus be negatively correlated with bond ratings. Greater public corruption has also been found to be negatively associated with bond ratings ([Depken and Lafountain, 2006](#)). This latter variable is taken from the Public Integrity Section of the US Department of Justice, which compiles

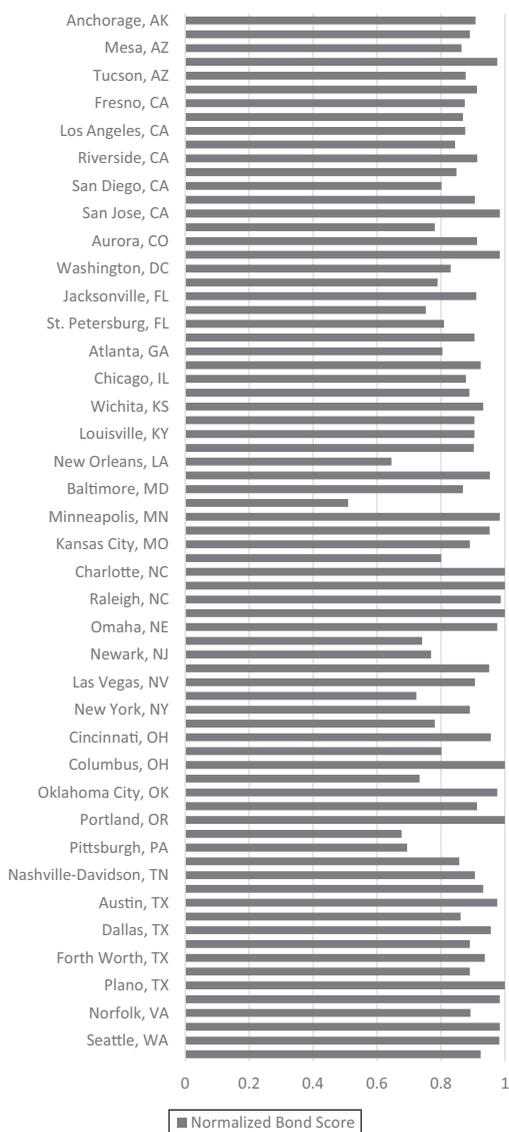


Figure 1.
Normalized bond
score by
metropolitan area

all federal corruption convictions of state and local public officials (converted per 100,000 residents for the purpose of this paper)[6].

Finally, regarding the institutional constraints, both the initiative and recall have been shown to be associated with policies more closely aligned with the median voter. These two variables would be expected to have an ambiguous effect on bond ratings, depending on the preference of the median voter. This would also be true of home rule, as it provides greater autonomy and leeway for a municipal government to deal with purely local issues, though it may also bring greater fiscal stress upon a municipal government to respond to those issues.

Table I.
Summary statistics

| Variable | Observations | Mean | SD | Minimum | Maximum |
|-------------------------------|--------------|---------|-----------|---------|-----------|
| Normalized bond score | 76 | 0.88 | 0.10 | 0.510 | 1.00 |
| Overall economic freedom | 80 | 6.73 | 0.93 | 4.57 | 8.07 |
| Poverty rate | 80 | 18.43 | 5.35 | 5.86 | 31.56 |
| Per capita income | 80 | 2.70 | 0.60 | 1.61 | 4.73 |
| Median age | 79 | 33.29 | 2.24 | 28.19 | 40.80 |
| Home ownership rate | 79 | 51.65 | 9.89 | 22.70 | 94.83 |
| Population | 82 | 679,164 | 1,011,646 | 192,369 | 8,248,136 |
| Per capita debt | 81 | 4.35 | 2.86 | 0.47 | 13.37 |
| Public corruption convictions | 81 | 0.33 | 0.17 | 0.11 | 0.90 |
| Local initiative (1 = Yes) | 82 | 0.90 | 0.30 | 0 | 1 |
| Local recall (1 = Yes) | 82 | 0.52 | 0.50 | 0 | 1 |
| Local home rule (1 = Yes) | 82 | 0.79 | 0.41 | 0 | 1 |

Unfortunately, again given the nature of the main independent variable of interest (economic freedom), it is only available for one year and therefore precludes the ability to use a panel dataset over multiple years. That said, it may be the case that the results obtained are associated with some random factor from the year under analysis. However, the results presented below should at least give some indication of the relationship between economic freedom and municipal borrowing costs. Given this, future research could be guided in a way that would extend this economic freedom index.

It may also be the case that the model is endogenous, in that bond ratings may also influence economic freedom. To help alleviate this potential problem, I average all applicable independent variables between 2003 and 2010[7]. These dates correspond with all observations after the local economic freedom index was compiled. This means the economic freedom variable can be thought of as being lagged in this model. In this way, any potential issues of endogeneity should be minimized.

Finally, while bond ratings are available for particular municipal governments, the economic freedom scores are compiled based on MSAs. Given this, there is not a perfect, one-to-one mapping between these variables. However, as noted the bond ratings are for the largest municipal governments by population. That said, several cities in the analysis make up their own MSA and for those that do not they tend to dominate the MSA that they are included in. Therefore, bond ratings and economic freedom scores should be close geographic and demographic approximations of each other and should not pose a serious concern. The following section lays out and discusses the results.

4. Results and interpretation

The initial results from the baseline model are presented in [Table II](#).

Here, Columns 1 through 3 list the baseline Tobit results, whereas Columns 4 through 6 also present OLS results for robustness. Further, Column 1 excludes all control variables, Column 2 includes all of the socioeconomic control variables discussed above, whereas Column 3 also includes the institutional variables. Columns 4 through 6 follow the same pattern.

Overall, the results indicate that in every specification higher local economic freedom scores are positively associated with higher bond scores, with all specifications statistically significant. Additionally, the control variables included also tend to have the expected sign coefficients as discussed. Given the nature of the variables included, while it is possible to determine the sign and significance from each specification, it is not possible to determine

| Variables | (1) Tobit | (2) Tobit | (3) Tobit | (4) OLS | (5) OLS | (6) OLS |
|-------------------------------|---------------------|---------------------|---------------------|-------------------|---------------------|---------------------|
| Overall economic freedom | 0.032*** (0.012) | 0.019** (0.0077) | 0.017** (0.0074) | 0.0304*** (0.011) | 0.018** (0.0076) | 0.016** (0.0076) |
| Poverty rate | -0.009*** (0.0032) | -0.0078** (0.0034) | -0.0078** (0.0034) | | -0.0093** (0.0035) | -0.0083** (0.0038) |
| Per capita income | 0.049** (0.023) | 0.053** (0.025) | 0.053** (0.025) | | 0.036 (0.022) | 0.040 (0.024) |
| Median age | -0.017*** (0.004) | -0.017*** (0.004) | -0.017*** (0.0042) | | -0.017*** (0.004) | -0.017*** (0.0043) |
| Home ownership rate | -0.00063 (0.0012) | -0.00064 (0.0012) | -0.00064 (0.0012) | | -0.0008 (0.0013) | -0.00077 (0.0014) |
| Population | 4.82e-09 (5.48e-09) | 6.03e-09 (4.76e-09) | 6.03e-09 (4.76e-09) | | 4.99e-09 (5.51e-09) | 6.00e-09 (5.03e-09) |
| Per capita debt | -0.0028 (0.0035) | -0.0019 (0.004) | -0.0019 (0.004) | | -0.0012 (0.0034) | -0.00044 (0.0039) |
| Public corruption convictions | -0.046 (0.073) | -0.036 (0.078) | -0.036 (0.078) | | -0.046 (0.075) | -0.036 (0.082) |
| Local Initiative (1 = Yes) | | 0.040 (0.025) | 0.040 (0.025) | | | 0.034 (0.027) |
| Local Recall (1 = Yes) | | -0.0083 (0.018) | -0.0083 (0.018) | | | -0.0073 (0.019) |
| Local Home Rule (1 = Yes) | | -0.044* (0.022) | -0.044* (0.022) | | | -0.040* (0.022) |
| Constant | 0.676*** (0.0851) | 1.42*** (0.20) | 1.41*** (0.20) | 0.68*** (0.081) | 1.47*** (0.21) | 1.45*** (0.22) |
| Observations | 74 | 69 | 69 | 74 | 69 | 69 |
| Log-Likelihood | 56.77 | 74.29 | 77.05 | 0.087 | 0.527 | 0.558 |
| R^2 | | | | | | |

Notes: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table II.
Tobit and OLS
results – municipal
economic freedom
score dependent
variable =
normalized bond
score

whether or not these findings are economically significant. Therefore, to quantify this effect, I follow [Depken and Lafountain \(2006\)](#) and apply estimates from [Rubinfeld \(1973\)](#) on the effect that a one notch change in the Moody's rating would have on borrowing costs. Specifically, [Rubinfeld \(1973\)](#) found that a one notch decline in Moody's ratings (which at the time did not have differentiated ratings between grades) from "AAA" to "AA" was associated with an increased interest rate of roughly 20.6 basis points. In terms of the ratings used today, this would suggest an increase in borrowing costs of roughly 6.87 basis points.

Thus, based on the obtained coefficients above, an increase in a municipality's bond score between 0.016 and 0.032 would suggest bond ratings that are between 0.336 and 0.672 notches higher. This would translate into lower borrowing costs between roughly \$231 and 462 per \$1m of debt at an assumed rate of interest of 5 per cent. Given that average outstanding municipal debt for the sample of municipalities used in this study in 2002 was roughly \$3.812bn (in real terms), this would indicate total interest cost savings between just under \$880,000 and just over \$1,800,000 respectively. Overall then, the results are all positive, statistically significant and economically significant.

In addition to evaluating the averaged normalized bond rating for all three of the major ratings, I also decompose the results for each of the normalized bond scores for each separate rating agency. These findings can be found in Tables III through V, with the layout and format following that of [Table II](#).

These results largely corroborate those found in the baseline model as well. Specifically, overall economic freedom is positively correlated with the S&P bond index in [Table III](#) and is also statistically significant in all specifications. Additionally, all specifications for the Moody's results ([Table IV](#)) also indicate a positive association, with results statistically significant in 4 of 6 specifications. The weakest results are found in [Table V](#) (which uses the Fitch ratings). While all coefficients are still positive, they are only statistically significant in 1 of 6 specifications. However, one factor that may be influencing this latter outcome is the low sample size ($N = 43$) and, especially with control variables included, the relatively few degrees of freedom available.

Finally, [Table VI](#) decomposes the overall economic freedom score into its various subcomponents of "size of government", "takings and discriminatory taxation" and "labor market freedom" with the normalized bond score again as the dependent variable.

For the sake of space, I only include the results when all controls are incorporated into the model. Columns 1 and 2 in [Table VI](#) show the Tobit and OLS results for "size of government" sub-indices respectively, Columns 3 and 4 do the same for the "taking and discriminatory taxation" score, and Columns 5 and 6 do so for the "labor market freedom" score, respectively.

Interestingly, when economic freedom is decomposed, there does not appear to be any direct relationship, either statistically or economically, between variables. Further, while the coefficients were not particularly large, they are all slightly negative. While the results in [Table VI](#) appear at first glance to be contradictory, they actually corroborate and support the evidence found at the international level ([Roychoudhury and Lawson, 2010](#)). In that study, while overall economic freedom was associated with higher bond ratings across countries, no one individual component drove the result. Thus, it is the overall "bundle" of economic freedom that explains the relationship with bond ratings. Further, along with corroborating generalizable, cross-country results from [Roychoudhury and Lawson \(2010\)](#), the findings are also consistent with [Lawson \(2006\)](#) who notes that what *should* matter is overall economic freedom and that decomposing this variable can, at least empirically, create a number of its own problems.

| Variables | (1) Tobit | (2) Tobit | (3) Tobit | (4) OLS | (5) OLS | (6) OLS |
|-------------------------------|------------------|---------------------|---------------------|-------------------|--------------------|---------------------|
| Overall economic freedom | 0.038*** (0.012) | 0.023** (0.0095) | 0.017* (0.0093) | 0.031*** (0.0096) | 0.0198** (0.0081) | 0.016* (0.0081) |
| Poverty rate | | -0.008** (0.0034) | -0.0066* (0.0034) | | -0.0083*** (0.003) | -0.0072** (0.0031) |
| Per capita income | | 0.043 (0.029) | 0.046 (0.031) | | 0.019 (0.023) | 0.024 (0.025) |
| Median age | | -0.017*** (0.006) | -0.018*** (0.0062) | | -0.015*** (0.005) | -0.016*** (0.0054) |
| Home ownership rate | | -0.00055 (0.0012) | -0.00068 (0.0012) | | -0.001 (0.001) | -0.0011 (0.0011) |
| Population | | 5.08e-09 (7.41e-09) | 5.37e-09 (6.24e-09) | | 0.00 (6.73e-09) | 5.73e-09 (5.64e-09) |
| Per capita debt | | -0.004 (0.0041) | -0.0022 (0.0044) | | -0.0023 (0.0032) | -0.0011 (0.0036) |
| Public corruption convictions | | -0.083 (0.077) | -0.07 (0.083) | | -0.068 (0.068) | -0.054 (0.078) |
| Local Initiative (1 = Yes) | | | 0.046 (0.036) | | | 0.038 (0.035) |
| Local Recall (1 = Yes) | | | -0.019 (0.024) | | | -0.013 (0.021) |
| Local Home Rule (1 = Yes) | | | -0.061** (0.03) | | | -0.046** (0.023) |
| Constant | 0.67*** (0.079) | 1.41*** (0.27) | 1.46*** (0.27) | 0.70*** (0.067) | 1.45*** (0.24) | 1.48*** (0.24) |
| Observations | 68 | 65 | 65 | 68 | 65 | 65 |
| Log-Likelihood | 27.22 | 41.02 | 44.47 | 0.108 | 0.465 | 0.518 |
| R^2 | | | | | | |

Notes: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table III.
Tobit and OLS
results – municipal
economic freedom
score dependent
variable = S&P
normalized bond
rating

Table IV.
Tobit and OLS
results – municipal
economic freedom
score dependent
variable = Moody's
normalized bond
rating

| Variables | (1) Tobit | (2) Tobit | (3) Tobit | (4) OLS | (5) OLS | (6) OLS |
|-------------------------------|------------------|---------------------|---------------------|------------------|---------------------|---------------------|
| Overall economic freedom | 0.040*** (0.015) | 0.024** (0.0098) | 0.022** (0.0095) | 0.038*** (0.014) | 0.024** (0.0092) | 0.021** (0.010) |
| Poverty rate | | -0.0078* (0.004) | -0.0066 (0.0043) | | -0.0088** (0.0044) | -0.008 (0.005) |
| Per capita income | | 0.086** (0.0033) | 0.091** (0.035) | | 0.057** (0.028) | 0.061** (0.030) |
| Median age | | -0.017*** (0.0047) | -0.017*** (0.0053) | | -0.017*** (0.0005) | -0.02*** (0.005) |
| Home ownership rate | | -0.00031 (0.0018) | -0.00029 (0.0018) | | -0.0005 (0.002) | -0.0004 (0.002) |
| Population | | 9.52e-09 (6.51e-09) | 1.05E-08 (7.01e-09) | | 1.03e-08 (6.80e-09) | 1.13e-08 (7.30e-09) |
| Per capita debt | | -0.005 (0.0045) | -0.004 (0.005) | | -0.002 (0.0039) | -0.0011 (0.0046) |
| Public corruption convictions | | -0.10 (0.088) | -0.092 (0.093) | | -0.09 (0.09) | -0.087 (0.099) |
| Local Initiative (1 = Yes) | | | 0.024 (0.03) | | | 0.012 (0.032) |
| Local Recall (1 = Yes) | | | -0.0053 (0.022) | | | -0.0005 (0.022) |
| Local Home Rule (1 = Yes) | | | -0.047* (0.027) | | | -0.038 (0.026) |
| Constant | 0.60*** (0.11) | 1.26*** (0.27) | 1.22*** (0.28) | 0.61*** (0.10) | 1.31*** (0.28) | 1.31*** (0.30) |
| Observations | 73 | 68 | 68 | 73 | 68 | 68 |
| Log-Likelihood | 39.71 | 59.77 | 61.25 | 0.096 | 0.529 | 0.544 |
| R ² | | | | | | |

Notes: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

| Variables | (1) Tobit | (2) Tobit | (3) Tobit | (4) OLS | (5) OLS | (6) OLS |
|-------------------------------|----------------------|----------------------|----------------------|----------------|----------------------|----------------------|
| Overall economic freedom | 0.041* (0.023) | 0.017 (0.014) | 0.017 (0.014) | 0.030 (0.018) | 0.010 (0.011) | 0.0094 (0.011) |
| Poverty rate | -0.016** (0.0066) | -0.013* (0.007) | -0.013* (0.007) | | -0.020** (0.0064) | -0.015* (0.007) |
| Per capita income | 0.009 (0.035) | 0.026 (0.04) | 0.026 (0.04) | | -0.010 (0.026) | -0.0023 (0.029) |
| Median age | -0.028*** (0.008) | -0.028*** (0.008) | -0.028*** (0.008) | | -0.024*** (0.007) | -0.024*** (0.007) |
| Home ownership rate | -0.002 (0.002) | -0.0015 (0.0026) | -0.0015 (0.0026) | | -0.002 (0.0023) | -0.0022 (0.003) |
| Population | -4.06E-09 (1.01e-08) | -2.11E-09 (8.45e-09) | -2.11E-09 (8.45e-09) | | -4.76e-09 (9.09e-09) | -3.72e-09 (7.71e-09) |
| Per capita debt | 0.0011 (0.006) | 0.0021 (0.006) | 0.0021 (0.006) | | 0.0032 (0.0042) | 0.0035 (0.005) |
| Public corruption convictions | -0.012 (0.11) | -0.007 (0.12) | -0.007 (0.12) | | 0.0044 (0.11) | 0.022 (0.13) |
| Local Initiative (1 = Yes) | | 0.050 (0.033) | 0.050 (0.033) | | | 0.047 (0.033) |
| Local Recall (1 = Yes) | | -0.02 (0.030) | -0.02 (0.030) | | | -0.018 (0.025) |
| Local Home Rule (1 = Yes) | | -0.060 (0.04) | -0.060 (0.04) | | | -0.027 (0.039) |
| Constant | 0.64*** (0.16) | 2.10*** (0.42) | 2.00*** (0.45) | 0.70*** (0.13) | 2.10*** (0.39) | 2.00*** (0.42) |
| Observations | 45 | 43 | 43 | 45 | 43 | 43 |
| Log-Likelihood | 13.20 | 26.25 | 28.12 | 0.061 | 0.560 | 0.589 |
| R^2 | | | | | | |

Notes: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table V.
Tobit and OLS
results – municipal
economic freedom
score dependent
variable = Fitch
normalized bond
rating

Table VI.
Tobit and OLS
results – municipal
economic freedom
subcomponent
variable = average
normalized bond
score

| Variables | Size of government score | | Takings and discriminatory taxation score | | Labor market freedom score | |
|-------------------------------|--------------------------|---------------------|---|---------------------|----------------------------|---------------------|
| | (1) Tobit | (2) OLS | (3) Tobit | (4) OLS | (5) Tobit | (6) OLS |
| Economic freedom score | -0.006 (0.010) | -0.005 (0.011) | -0.016 (0.013) | -0.011 (0.013) | -0.010 (0.0087) | -0.009 (0.0090) |
| Poverty rate | -0.009** (0.0034) | -0.010** (0.0037) | -0.0090** (0.0034) | -0.0093** (0.0038) | -0.009** (0.003) | -0.010** (0.0040) |
| Per capita income | 0.05** (0.024) | 0.037 (0.023) | 0.051** (0.025) | 0.037 (0.024) | 0.050* (0.025) | 0.033 (0.023) |
| Median age | -0.017*** (0.004) | -0.017*** (0.0042) | -0.016*** (0.0040) | -0.016*** (0.0041) | -0.017*** (0.0042) | -0.016*** (0.0043) |
| Home ownership rate | -0.0008 (0.0014) | -0.0010 (0.002) | -0.00065 (0.0013) | -0.0008 (0.0014) | -0.0006 (0.0013) | -0.0007 (0.0015) |
| Population | 2.29E-09 (4.58e-09) | 2.26E-09 (4.83e-09) | 1.01E-09 (4.52e-09) | 1.32e-09 (4.78e-09) | 2.88E-09 (4.51e-09) | 2.87e-09 (4.81e-09) |
| Per capita debt | -0.0014 (0.004) | 6.25E-05 (0.004) | -0.0012 (0.0041) | 0.0004 (0.004) | 2.87E-05 (0.0042) | 0.0013 (0.0040) |
| Public corruption convictions | -0.028 (0.08) | -0.030 (0.083) | -0.044 (0.080) | -0.040 (0.085) | -0.040 (0.082) | -0.040 (0.087) |
| Local Initiative (1 = Yes) | 0.035 (0.026) | 0.030 (0.028) | 0.040 (0.030) | 0.032 (0.030) | 0.0347 (0.025) | 0.030 (0.030) |
| Local Recall (1 = Yes) | -0.0074 (0.021) | -0.0080 (0.021) | -0.0063 (0.020) | -0.007 (0.020) | -0.0060 (0.020) | -0.006 (0.020) |
| Local Home Rule (1 = Yes) | -0.050** (0.022) | -0.046** (0.021) | -0.046* (0.025) | -0.043* (0.024) | -0.045* (0.024) | -0.041* (0.023) |
| Constant | 1.58*** (0.21) | 1.60*** (0.22) | 1.61*** (0.23) | 1.63*** (0.26) | 1.60*** (0.22) | 1.63*** (0.23) |
| Observations | 69 | 69 | 69 | 69 | 69 | 69 |
| Log-Likelihood | 77.05 | 77.82 | 77.82 | 77.82 | 77.50 | 77.50 |
| R ² | | 0.542 | | 0.547 | | 0.548 |

Notes: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

From the evidence presented above then, in general, it is the case that bond ratings are positively associated with greater overall economic freedom at the municipal level. Along with corroborating similar evidence found at the international level (Roychoudhury and Lawson, 2010) and at the state level (Calcagno and Benefield, 2013; Belasen *et al.*, 2015), this also provides evidence on how it is that bond ratings respond to differences in economic freedom at the municipal level.

Here, greater economic freedom tends to be associated with increased entrepreneurial opportunities and activity, tends to increase in-migration and tends to be associated with relatively more time-consistent policy. Given this, where overall economic freedom is increasing or relatively higher, this tends to lead to greater entrepreneurship and firm formation, which increases economic growth and the potential tax base within a municipal government which tends to stabilize public finances, especially through downturns. It is these factors that would play an important role and impacting bond ratings. This suggests that it is the overall institutional environment that a higher economic freedom score may represent and not some particular aspect associated with the bundle. Future research could address these possibilities in more detail. Further, to the extent that these results are causal and generalizable, it would suggest that an effective way to increase bond ratings and thus lower borrowing costs would be to pursue public policies that are aimed at increasing overall economic freedoms available to individuals within a local jurisdiction to positively impact the borrowing costs that a given local government faces.

5. Conclusion

This article has added to a growing literature on the effects of economic freedom broadly and how economic freedom might affect bond ratings in particular. Specifically, this paper has used a new index of economic freedom at the municipal level in the US to see if this has an effect on municipal bond ratings. Briefly, the results do in fact indicate that greater overall economic freedom, though not necessarily the subcomponents of economic freedom, is strongly and positively correlated with higher bond ratings, which implies lower overall borrowing costs for a given municipal government. Specifically, the economic effect suggests that a one standard deviation increase in economic freedom is associated with borrowing costs that are \$880,000 to 1,800,000 lower. These findings not only corroborate previous scholarly work on the issue but also should provide additional avenues for future research.

Notes

1. Information regarding the EFW and EFNA index is freely available at www.freetheworld.com.
2. For a complete description of the municipal economic freedom index consult Stansel (2013).
3. Data and further information regarding these municipal bond ratings are freely available at: www.census.gov/govs/local/
4. For instance, a “AAA” rating from Fitch would correspond to a score of 19, whereas a rating “AA+” would correspond to a score of 18. Each of these scores is then divided by the highest possible score for each rating agency.
5. Not every rating agency rated each municipal government for a given year. Where this was the case, then the values for those rating agencies that did rate a given municipality were used.
6. Information is freely available at www.justice.gov/criminal/pin. Unfortunately, these data are aggregated to the state level by the Department of Justice. Thus, this variable includes statewide convictions as a proxy for local corruption.
7. Debt data were only available as recently as 2002. Therefore, I opt to use data from this year for the per capita debt variable.

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Corresponding author

John Dove can be contacted at: jadove@troy.edu