Credit Quality and Optimal Municipal Slack Resources

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Abstract

The question of what constitutes an "optimal" level of slack resources is at the heart of contemporary local government financial management, and the answer to that question is often "it depends." In this paper I address the "depends" aspect by examining how institutional, financial, and other contextual factors shape the basic relationship between slack resources and credit quality. In other words, upon what does it depend? What characteristics of a jurisdiction obviate the need for more or less slack resources? I examine this issue in the context of credit quality, as credit quality improvement is one of the most often cited motivations for maintaining slack resources. I estimate the basic relationship between various kinds of slack resources and credit quality, controlling for other relevant credit quality factors, within a national sample of several hundred local governments. I then use those estimates to examine the parameters of the slack resource-credit quality relationship in several different contexts. The basic finding is that slack resources matter at the margins. Credit quality is largely a function of structural characteristics like resource munificence and population, and slack's effect is mostly contingent on those parameters. Jurisdictions are rarely able to leverage slack resources to overcome structural deficiencies that might impede their credit quality. These findings have implications for future work on slack resources, for debt management broadly, and for some contemporary debates in governmental accounting.

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Introduction

Much of state and local government financial management revolves around the core financial management objectives of maintaining stable expenditures and achieving the lowest possible cost of capital. Each jurisdiction is subject to a unique set of structural parameters - like its revenue generation capacity, formula-driven or entitlement expenditure obligations, tax and expenditure limitations, outstanding debt and other liabilities, and others - that limit its ability to achieve those objectives. Slack financial resources like fund balance, net assets, and formal stabilization funds can help to eclipse these constraints. Stabilization funds can help to backfill revenue shortfalls. Fund balance can substitute for required annual pension contributions or debt service payments during downturn years. For these reason slack resource management is one of the most widely discussed concerns in contemporary financial management, even though traditional public finance theory makes no mention of sub-national fiscal stabilization.[1]

Slack resource management is a challenging issue in part because all jurisdictions face constraints on their ability to generate and maintain those resources. To create slack, a jurisdiction must forego near-term consumption. This is an especially difficult proposition during recessionary periods, when the demand for near term consumption is greatest. In the long-term, excessive slack is thought to distort citizens' understanding of the costs and benefits of government services, to create an unfair and perhaps regressive tax burden, and to violate government's basic fiduciary responsibilities.

For these and other reasons slack resource management is often discussed in terms of optimal capacity. That is, given its unique set of financial management constraints, how much slack should a jurisdiction maintain? If it keeps too little, that slack will do little to help achieve its financial management objectives. It it keeps too much, it risks violating key public administration values like equity and responsiveness, and exacerbates many

[1]see, for instance, Richard Musgrave and Peggy Musgrave. *Public Finance in Theory and Practice*, 3rd ed., McGraw Hill, 1980; Edward M. Gramlich, "Subnational Fiscal Policy." In *Perspectives on Local Public Finance and Public Policy.* J. M. Quigley, ed. Greenwich, CT, JAI Press 3(1987): 3-27.

of public financial management's principal-agent problems.[2] As such, a sophisticated understanding of the "optimal" level of slack resources is central to effective sub-national financial management.

In this paper I ask two interrelated questions. First, what is the relationship between slack resources and credit quality? Achieving the best possible credit quality is a well-known reason for slack resource maintenance. The basic logic is simple - borrowers who have some degree of slack resources are in a better position to make timely debt service payments. The major credit rating agencies have published guidance on how to determine an appropriate level of slack and an appropriate slack resource management policy, and the Government Finance Officers Association has made several policy statements about appropriate fund balance levels and policies. A recent survey of local government managers indicates that "improving credit quality" is one of the three most important financial management objectives that motivates slack resource creation.[3] A quick search of *The Bond Buyer* - the daily trade publication for the municipal debt industry - shows the term "fund balance" has appeared on 1900 separate days since 1990. In this context slack is often discussed in terms of rules of thumb, benchmarks, and other heuristics. But surprisingly, there is little if any systematic empirical research on the slack-credit quality relationship at the local level.

The second, and arguably more important question, is how does the slack resources-credit quality relationship vary with respect to the previously mentioned constraints on financial management effectiveness? In particular, are there circumstances where the same level of slack has differential effects on credit quality for different jurisdictions?

To address these questions I first draw upon two different streams of the financial management literature to develop an explanatory model of local government credit qual-

[2] Some recent papers examine the determinants of slack resource levels from a principal-agent perspective. See, for instance, Rebecca Hendrick, "The Role of Slack in Local Government Finances." *Public Budgeting & Finance* 26(1): 14-46, 2006

[3] Justin Marlowe, "Fund Balance, Working Capital, and Net Assets." In *Public Financial Management*, Howard Frank, ed. Boca Raton, FL, Taylor & Francis, 2006

ity. That model includes slack resources, as well as important characteristics of the issue and the issuer identified in previous work. I then estimate the basic relationship between credit quality and different types of slack resources for 277 city and county tax-exempt bond issues from 2005-2007. I then use those parameter estimates to examine the slack resources-credit quality relationship under different scenarios where the same level of slack resources is thought to have differential effects on credit quality. For example, jurisdictions with high outstanding debt obligations are thought to benefit more from the same level of slack than than jurisdictions with low outstanding debt obligations. I explore several of these scenarios, in effect placing the basic slack resources-credit quality relationship in several different contexts.

Three basic findings emerge. First, slack resources matter at the margins. For most jurisdictions conventional levels of slack have little or no effect on credit quality. Only once a jurisdiction keeps comparatively high levels of slack, namely at the eightieth percentile or above relative to other jurisdictions, does it have credit quality implications.

Second, this relationship is, for the most part, not context specific. Jurisdictions that might benefit from more slack typically do not, and jurisdictions that have solid financial management fundamentals often achieve good credit quality regardless of slack levels. Moreover, where there is a discernable context-specific effect, the variability around that estimated effect is high.

And third, different types of resources appear to have different credit quality implications. In particular, reserved general fund balance has the least discernable effect, where unrestricted net assets has the most discernable effect. This finding has important implications for government accounting and financial reporting, as assumptions about the advantages of government-wide financial reporting were key to the development of Governmental Accounting Standards Board (GASB) Statement 34. These findings suggest a key indicator of government-wide slack resources is value-added to the credit ratings process.

Beyond concerns about optimal slack resources, these findings shed light on three other key contemporary public financial management issues. First, and related to the optimal slack resource question, they provide a potential explanation for slack resource "hording," or the observed tendency for municipalities to keep slack resource levels in excess of several times annual expenditures, but with no any evidence that those resources are used to stabilize expenditures during downturn years.[4] The findings presented herein imply that high levels of slack might, in fact, follow from deliberate attempts to improve credit quality.

The recent turbulence in the municipal capital markets caused substantial harm for the municipal bond insurance industry. Several key insurers collapsed or have scaled back their market presence. One of the many long-term implications of the decline of insurance is the "de-commoditization" of municipal bonds. The municipal bond market has more than $2.3 trillion in outstanding debt, and that debt has been issued by more than 50,000 unique units of government. The enormous variation in these issuers and the relative opacity and scarcity of financial information about them creates an enormous need for cheap and efficient mechanisms to mitigate potential information asymmetries between issuers and potential investors.[5] Municipal bond insurance provides that sort of heuristic. But in the absence of insurance, investors will likely seek alternative heuristics. Underlying ratings might play a broader role in credit quality analysis under these new market circumstances, so any and all insight into the determinants and information content of underlying ratings is important.

A third implication surrounds the Governmental Accounting Standards Board's recently proposed standard, titled *Fund Balance Reporting and Governmental Fund Type*

[4] see Gerasimos Gianakis and Douglas Snow, "The Implementation and Utilization of Stabilization Funds by Local Governments in Massachusetts." *Public Budgeting & Finance* 27(1): 86-103, 2007; Justin Marlowe, "Fiscal Slack and Contercyclical Expenditure Stabilization: A First Look at the Local Level." *Public Budgeting & Finance* 25(3), 2003: 48-72

[5] On this point see Jun Peng and Peter F. Brucato, "An Empirical Analysis of Market and Institutional Mechanisms for Alleviating Information Asymmetry in the Municipal Bond Market." *Journal of Economics and Finance* 28, 2 (2004): 226-238.

Definitions. Current fund balance reporting standards allow for fund balance to be classified as "reserved," "designated," or "unreserved" depending on the extent to which those resources are segregated for specific purposes within their respective fund. Those classifications, the Board suggests, do not provide users with adequate information about potential uses of those resources because of variation in the degree of enforceability of those classifications. In other words, even though designated fund balance implies managerial intent to use fund balance resources in a particular way, that intent is more binding in some jurisdictions than in others. The proposed new standard reorganizes these distinctions around the extent to which the jurisdiction must, in fact, honor fund balance assignments. It proposes a new five category reporting scheme with "non-spendable" resources at one end, and "unassigned" resources at the opposite end.

These findings matter to this debate about fund balance reporting because they suggest that information about the degree of restrictedness of fund balance resources has unique information content relative to the less restricted designated and unreserved undesignated categories. Although there is ambiguity about exactly what comprises reserved fund balance (a key motivation for the new proposed standard), of the three types of resources classified under the current standards, reserved fund balance are most often the most enforceable. That the credit rating process responds to this basic distinction between restrictiveness and non-restrictiveness suggests the proposed standard could add value in the future.

The remainder of this discussion appears in five parts. In the next section I define slack resources and identify the factors believed to motivate slack resource creation and maintenance. As mentioned, that discussion draws upon much of the existing financial management literature. The next section develops a model of local government credit quality. It also draws on the relevant public financial management literature. The third section presents the data and methodology. The fourth section presents the findings, and the final section outlines their implications.

Slack Resources and Public Financial Management

There are four principal types of local government slack resources. The first three are derived from fund balance, or is the difference between assets and liabilities in any governmental fund. I focus here on general fund balance because for most local governments the general fund is the largest fund and the fund that accounts for core services.

According to generally accepted accounting principles, fund balance can be reported in one of three categories: 1) "reserved," or resources that have been legally restricted for some future use; 2) "designated," or resources that have been segregated by management for some anticipated purpose; and 3) "reserved," or resources that have not been designated for any future use. Reporting practices for each of these categories vary substantially. For instance, many jurisdictions maintain formal contingency funds established through statute or through governing body approval. Funds with that degree of oversight are most often reported as reserved general fund balance. But by contrast, many jurisdictions have informal contingency funds that are not subject to the same degree of governing body oversight, but serve the exact same purpose and are deployed under the exact same circumstances as governing body- approved funds. These "informal" funds are often reported as designated fund balance, even though they all but equivalent to more formal reserved fund balances. This variation in reporting practices has motivated the Governmental Accounting Standards Board to consider new standards to clarify these distinctions.

Nonetheless, general fund balance is perhaps the most widely discussed form of local government slack resources. In this analysis I include all three general fund balance types. Each is expressed as a percentage of total general fund expenditures. Given the potential for year-to-year variation in those levels, I calculated the three-year moving average for each.[6]

[6] As a robustness check I replicated all the analysis mentioned herein using a five-year moving average. Results were identical.

A fourth type of local government slack - unrestricted net assets in the governmental activities - has emerged following the advent of GASB Statement 34. Unrestricted net assets provides similar information as unreserved fund balance, albeit at the government-wide level rather than the fund level. It appears in each jurisdiction's government-wide statement of net assets. Recent research[7] has shown that government wide financial information has unique information content compared to fund-based financial information. For that reason, I include this measure. To standardize unrestricted net assets I recalculated them as a percentage of total expenses in the governmental activities. And like the fund balance measures, I focus on each jurisdiction's three year moving average for that measure. Descriptive statistics for these slack resource measures are reported in Table 1.

Slack resources are thought to address many potential problems in local public financial management. I examine three of those problems here.

The first is protection against expenditure volatility.[8] When expenditures are unpredictable, because of growth, development, natural disasters, or some other reason, slack resources mitigate the need for additional revenues or redirected resources to meet those new expenditure needs. To control for expenditure volatility I calculated the ten year coefficient of variation for each jurisdiction's total general fund expenditures from 1995-2005. Those coefficients are reported in Table 2. They range from a low of 3.5%, or a ten year standard deviation of just over 3.5% of the jurisdiction's mean annual expenditures, to a high of more than 117%.

The second reason is counter-cyclical protection against revenue trends and volatil-

[7]Elizabeth Plummer, Paul D. Hutchinson, and Terry K. Patton, "GASB No. 34's Governmental Financial Reporting Model: Evidence on its Information Relevance." *The Accounting Review* 82, 1 (2007): 205-240

[8]On this point see Kenneth A. Kriz, "The Optimal Level of Local Government Fund Balances: A Simulation Approach." National Tax Association: Proceedings from the 95th Annual Conference on Taxation, 2002; Gianakis and Snow, ibid; Marlowe, ibid; for state level perspectives see Michael Dothan and Fred Thompson, "A Better Budget Rule." Working Paper, Wilamette University, 2007; Yilin Hou, "What Stabilizes State General Fund Expenditures in Downturn Years - Budget Stabilization Fund or General Fund Unreserved Undesignated Fund Balance?" *Public Budgeting & Finance* 23(3): 64-91, 2003; Gary A. Wagner and Erick M. Elder, "The Role of Budget Stabilization Funds in Smoothing Government Expenditures Over the Business Cycle." *Public Finance Review* 33(4): 439-465, 2005

ity. By keeping slack resources, the logic suggests, a jurisdiction bolsters its ability to weather a n economic downturn without raising taxes, collecting new fees, or reallocating resources. [9] To measure that volatility I calculated a revenue return "beta"[10] by regressing each jurisdiction's annual total general fund revenues on the annual state gross domestic product for the state where that jurisdiction is located. The time period for that regression was 1995-2005. The "beta" is the resulting standardized regression coefficient for state GDP. Substantively, that coefficient indicates the change in state revenues, in terms of standard deviations, that associates with a change in state GDP. Those betas range from negative -.85, or a jurisdiction whose revenues move almost in opposite of state economic conditions, to .99, or a jurisdiction whose revenues move virtually in tandem with state economic conditions.

Municipalities that rely on intergovernmental revenues experience a distinct form of revenue uncertainty. This is because intergovernmental revenues, and in particular state government assistance, are subject to rapid and often unpredictable state level fiscal policy changes.[11] I control for intergovernmental revenue volatility by including in the model each jurisdiction's intergovernmental revenues as a percentage of total general fund revenues. As shown in Table 1, that variable ranges from no intergovernmental revenue dependence to more than three-quarters of general fund revenues from intergovernmental sources.

The third catalyst for slack resource long-term liabilities. Slack resources serve several purposes, from coverage requirements to debt service reserve funds. I examine three types of those liabilities. The first is direct debt, or bonds secured by a revenue pledge

[9] for state level perspectives on this issue see Hou, ibid; John D. Vasche and Brad Williams, "Revenue Volatility in California," *State Tax Notes* 36 (2005): 35-46; Philip G. Joyce, "What's So Magical About Five Percent? A Nationwide Look at Factors that Influence the Optimal Size of State Rainy Day Funds." *Public Budgeting & Finance* 21, 2 (2001): 62-87; John C. Navin and Leo J. Navin, "The Optimal Size of Countercyclical Budget Stabilization Funds: A Case Study of Ohio." *Public Budgeting & Finance* 17, 2, (1997): 114-127.

[10] see, for example, John Y. Campbell, Andrew W. Lo, and A. Craig MacKinlay, *The Econometrics of Financial Markets* (Princeton, NJ: Princeton University Press, 1997)

[11] On this point see Kriz 2003; for state level commentary see Joyce, ibid; Navin and Navin, ibid

exclusively from the jurisdiction in question. The second is overlapping debt, or tax-supported debt incurred by a jurisdiction whose boundaries overlap the jurisdiction in question. The third is the jurisdiction's actuarial accrued pension liability. That liability is the total difference between the assets and liabilities in each of the the jurisdiction's pension funds.[12] Each of these variables is presented on a per capita basis. Like the slack resource measures, these variables are expressed in terms of three year moving averages because of the potential for year-to-year variability. As shown in Table 1, these liabilities vary substantially, from no liability to liabilities exceeding several thousand dollars per capita.

A Model of Municipal Credit Quality

In this section I develop a model of local government credit quality. That model includes all of the previously mentioned characteristics thought to motivate slack resource maintenance. It also includes other institutional characteristics shown elsewhere[13] to affect municipal credit quality, and characteristics of the issue itself thought to affect that quality.

The dependent variable is the higher of the jurisdiction's Moody's or Standard & Poor's credit rating. For issues that had purchased bond insurance, and are subsequently 'AAA' rated, I used Moody's or Standard & Poor's underlying rating.[14] Ratings were coded according to the ordinal scale presented in Table 2.

[12]Pension liabilities should be interpreted with caution because actuarial methods to determine those liabilities vary across jurisdictions

[13]see Justin Marlowe, "Much Ado About Nothing? The Size and Credit Quality of Municipal Other Postemployment Benefit Obligations," *Public Budgeting & Finance* 27, 2 (2007): 104-131

[14]There is potential for selection bias here because in most cases a jurisdiction receives an underlying rating only if requests it. Since jurisdictions with implicitly higher credit quality are more likely to request those ratings, the data on underlying ratings might be biased upwards. To check this I ran a t test of the difference between the mean population of AAA rated issuers that had purchased insurance and AAA issuers that had not purchased insurance. That difference was not statistically significant at conventional levels. I ran a similar test of the difference between the mean per capita income of AAA rated issuers that had and had not purchased insurance. That difference was also not significant. These tests suggest rated insured and rated non- insured issues are not significantly different with respect to these two key credit quality determinants.

The model also includes three issue specific characteristics as explanatory variables. The first is whether the issue's proceeds were to refund another outstanding issue. It's important to control for this because credit quality of refunding issues is indirectly related to the quality of another, perhaps unrelated issue. It also includes whether the issue is a lease revenue bond backed by a pledge of general fund revenues or certificates of participation.[15] These issues are backed by the same appropriations as most general obligation bonds, but they are usually rated at least one notch lower because they lack a true general obligation pledge. I also control for "dual purpose" or "multi-purpose" issues. These are general purpose bonds that are backed by a larger pool of capital like a revolving fund or state bond insurance program. These bonds are classified as general purpose, but almost always have some additional purpose like school construction or sewer infrastructure. The implication for credit quality is that the secondary backing makes these issues more creditworthy.

I also include several jurisdiction level characteristics known to affect credit quality.[16]. Multiple measures are necessary in part because, as Hendrick[17] suggests, "...slack has a fairly complex relationship with governments' other fiscal structural features and environment, which makes determining its specific and relative contribution to alleviating fiscal stress rather elusive."

In previous research population has been shown to have a positive relationship with credit quality because larger jurisdictions tend to have more robust tax bases and more professionalized financial management staff. I control for population by including in the model the natural log of the jurisdiction's population according to the 2000 U.S. Census. I also include per capita income as an additional measure of resource munificence. Previous work has shown per capita income is the principal determinant of local government

[15]Both are denoted as "lease" issues
[16]Marlowe, ibid
[17]Rebecca Hendrick, "The Role of Slack in Local Government Finances." *Public Budgeting & Finance* 26, 1 (2006): 14-46.

credit quality.[18] I control for per capita income by including the jurisdiction's per per capita income from the 2000 U.S. Census. I also include, as an additional control for professionalism, whether the jurisdiction utilizes the council-manager form of government.[19]. Council-manager governments are believed to have better credit quality.

Data and Methods

The analysis was conducted on tax-supported, tax exempt, general purpose bonds issued by cities, villages, and counties from 2005-2007. I focus on tax-supported general purpose debt because the credit quality for those types of bonds will be most directly affected by the general purpose governments financial management characteristics like slack resources. This is in contrast to, say, revenue-backed debt where credit quality is determined largely by the quality and predictability of the revenue stream(s) supporting the issue.

To construct the sample I used the Bloomberg Professional Service to identify the universe of bonds general purpose bonds issued by local governments during the time period in question. I then matched those bonds with data from several other sources. Financial variables were taken from the Government Finance Officers Association (GFOA) Municipal and County Financial Indicators datasets for 1995-2005. These datasets include several variables collected from the comprehensive annual financial reports of jurisdictions that apply for GFOA's annual Excellence in Financial Reporting award.[20] Issues

[18] Marlowe, ibid

[19] For counties, this is the council-executive form

[20] There is potential for selection bias here because jurisdictions that receive this award are typically affluent with highly professionalized financial management staff. They in turn have implicitly higher credit quality than those that have not received the award. The net effect is that a sample limited to award recipients could be biased toward higher credit quality issuers, and might lead to incomplete conclusions about the To check this I ran a t test of the difference between the mean population of award winners vs. non-award winning cities, villages, and counties. That difference was not statistically significant at conventional levels. I ran a similar test of the difference between the mean per capita income of award winners and award non-winners. That difference was also not significant. These tests suggest these two types of jurisdictions are not significantly different with respect to two key credit quality determinants.

were included if complete data were available from 2000-2005 for slack resources, debt obligations, and pension obligations, and if complete data on revenues and expenditures were available from 1995-2005. I then matched the remaining bonds against data on the issuers' demographics taken from the 2000 U.S. Census. Finally, I incorporated data on the issuer's form of government from two different surveys conducted by the International City/County Management Association - the 2005 State of the Profession Survey, and the 2002 Survey of Employee Health Care Benefits. Both surveys include the item about whether the jurisdiction is a council-manager or mayor-council form of government. The later has better coverage of county governments. A total of 277 issues met all these criteria. Those issues comprise the final sample used in this analysis.

I explore the relationship between slack resources and credit quality using a two-stage analytical process. In the first stage I used ordered probit regression to estimate the model of local government credit quality described above. Bivariate correlations indicated no apparent multicolinearity problem, and the Wald [21] test indicated these data meet the parallel regressions assumption for ordered probit modeling. Because of wide dispersion in some of the explanatory variables the models were fitted with Huber-White robust standard errors to correct for any potential heteroskedasticity problem.

I estimated two different versions of that basic model. Both sets of estimates are reported in Table 3. Model I controls for all three types of general fund balance, and also controls for unrestricted net assets of the governmental activities. This estimation allows us to isolate the effect of each type of general fund balance on credit quality. Model II controls for total general fund balance and for unrestricted net assets in the governmental activities.[22]

The Model I estimates reveal the basic relationship between slack resources and credit quality, holding constant other relevant factors. In the second stage I turn to what is

[21] Ronald Brant, "Assessing proportionality in the proportional odds model for ordinal logistic regression." *Biometrics* 46 (1990): 1171-1178.

[22] The regression models include the natural log of population and per capita income.

arguably the more interesting question: is that basic relationship contingent upon those other relevant factors? In other words, do slack resources have a stronger positive effect on credit quality for some types of issuers than for others?

Results

The ordered probit estimates for the first stage analysis are presented in Table 1. The χ^2 test indicates a non-trivial model fit, and the prediction rate statistics indicate this model correctly predicts an issuer's credit rating more than 37% of the time. This fit is comparable to previous work on local government credit quality. [23]. All coefficients are in their expected direction, and the statistically significant variables are consistent with previous findings.

For the second stage analysis I derived predicted probabilities of credit ratings for jurisdictions under different financial and institutional characteristics.[24] For simplicity, I focus on the relationship between three different slack resource indicators - reserved fund balance, total general fund balance, and unrestricted net assets of the governmental activities - and the probability of A1/A+ (i.e. A+) and Aa1/AA+ (i.e. AA+) ratings at varying levels of three contextual variables - population, per capita income, and overlapping debt. I chose these particular slack resource indicators and contextual variables because they were statistically significant in the basic models presented in Table 3.

Figure 1 presents the relationship between slack resources and credit quality under 36 different sets of circumstances. Each graph follows the same format. The y axis is

[23]Marlowe, ibid

[24]This was done with King, Tomz, and Wittenberg's CLARIFY routine. This procedure starts by creating an asymptotic normal distribution for each parameter with mean equal to its estimate and variance derived from the variance-covariance matrix of all the model parameters. It then simulates those parameters by taking random draws from those synthetic distributions. In this case those distributions were based on 1000 random draws. This is, in effect, the same as redrawing 1000 different samples of 277 different bonds during the same time period. This simulation approach is advantageous because it allows for construction of a confidence interval around the predicted probabilities. That confidence interval is necessary and, to some degree, more important to the substance of the findings than the actual probability estimate.

the probability of either a A+ or AA+ rating. These probabilities vary from 0 to .5 (i.e. no chance to a 50% chance). The x axis is the level of slack resources. For clarity and uniformity of presentation I report these levels in terms of percentiles within the sample.[25] Results are presented in terms of "small population" and "large population" issuers, issuers with "low per capita income" and "high per capita income," and issuers with "low overlapping debt obligations" and "high overlapping debt obligations." For each, the low category is the 25th percentile and the high category is the 75th percentile.[26] The thick line is the predicted probability and the dashed lines are the low and high values of a 95% confidence interval around that probability.

For example, in the upper-left graph in Panel A of Figure 1 presents the simulated relationship between unrestricted net assets of the governmental funds and the predicted probability of an A+ rating for issuers with high overlapping debt. For this type of issuer, the simulations suggest, unrestricted net assets at the 60th percentile of all issuers (or 44.6% of governmental activities expenses) associate with a 20% chance of earning an A+ rating. According to the expressed confidence intervals that probability could be as low as 14% or as high as 28%. As expected, the general trend suggests a negative relationship - more slack resources associate with a lower probability of a comparatively low A+ rating. This same relationship for the predicted probability of a AA+ rating is presented in Panel B. Note the relationship here is reversed - more slack resources associate with a higher probability of the more desirable AA+ rating. This comparative analysis of the basic slack resources-credit quality relationship under different circumstances is the heart of this paper.

[25] Actual values for these percentiles are as follows: for reserved general fund balance, the 25th percentile is .7% of general fund expenditures and the 75th percentile is 7% of general fund expenditures; for total general fund balance the 25th percentile is 21.7% of total general fund expenditures, and the 75th percentile is 51.8% of total general fund expenditures; for unrestricted net assets of the governmental activities, the 25th percentile is 14.1% of total expenses of the governmental activities, and the 75th percentile is 64.9% of total expenses of the governmental activities.

[26] Actual values here are as follows: low population = 23,312 and high population = 125,196; low per capita income = $18,919 and high per capita income = $27,030; low overlapping debt = $433/ capita and high overlapping debt = $2,146/capita.

The basic finding revealed by this exercise is that credit quality is largely a function of characteristics beyond the control of financial managers, and that enormous amounts of slack are required to gain any leverage on that relationship. Wealthier and larger jurisdictions enjoy an implicit credit quality advantage ranging from ten to twenty percent increased likelihood of a higher rating or decreased likelihood of a lower rating. Not until a jurisdiction is in the upper quartile of slack resource levels is there a discernable credit quality effect. That relationship is consistent across both ratings categories and in most every context examined here.

A key, if secondary finding is that the relationship between unrestricted net assets and credit quality is different than for other types of fund balance resources. Not only is the basic relationship across different levels of slack different, but the confidence intervals around the predicted probabilities are different. The later suggests the credit raters' response to unrestricted net assets is more uniform and predictable than for traditional fund balance measures. While not unexpected, this is an important finding with implications for several aspects of governmental accounting.

Discussion

This paper sought to shed new light on the "optimal" level of local government slack resources. The basic analytical approach was to examine whether slack resources have differential effects on credit quality in different contexts. The basic finding is that, in fact, for most jurisdictions, even those that might benefit the most from keeping higher levels of slack, there is only a limited discernable credit quality benefit for keeping that slack. To the extent that slack does make a difference, that difference is clearest when issuers with high overlapping debt obligations keep extremely high levels of slack. Otherwise, there is little evidence that slack can help to mitigate the potential negative effects of weak resource munificence or other weak financial fundamentals.

These findings set the stage for several potential follow-up studies. First and foremost, future research should consider the relationship between slack and actual borrowing costs on municipal bonds. Although there is only limited evidence that buy-side analysts and other municipal bond investors review issuer's financial statements, it also seems intuitive that simple heuristic indicators like slack resources are efficient sources of information for investors who choose to do even a cursory review of that information. And as mentioned, in the wake of the collapse of the municipal bond insurance industry, buy side analysis might more regularly rely on new sources of information about issuers like underlying ratings and CAFRs.

Follow-up research should also consider if and how slack resource policies matter. The limited research on those policies at the local level shows that most are informal and not codified in statute or governing-body approved mechanisms.[27] But at the state level there is persuasive evidence that slack resource institutions like budget stabilization funds matter.[28] Follow-up research should look at these same dynamics at the local level.

This study is somewhat limited by its static analysis. Future work might consider this same slack-credit quality relationship in a dynamic context, perhaps by examining slack levels before and after credit rating changes.

[27] Michael Wolkoff, "An Evaluation of Municipal Rainy Day Funds." *Public Budgeting & Finance* 5, 2 (1987): 52-63; Gianakis and Snow, ibid; Justin Marlowe, *The Local Fund Balance: Explanations and Implications*, Unpublished Doctoral Dissertation, University of WI-Milwaukee, 2004.

[28] see, for instance, Craig L. Johnson and Kenneth A. Kriz, "Fiscal Institutions, Credit Ratings, and Borrowing Costs." *Public Budgeting & Finance* 25, 1 (2005): 84-103.

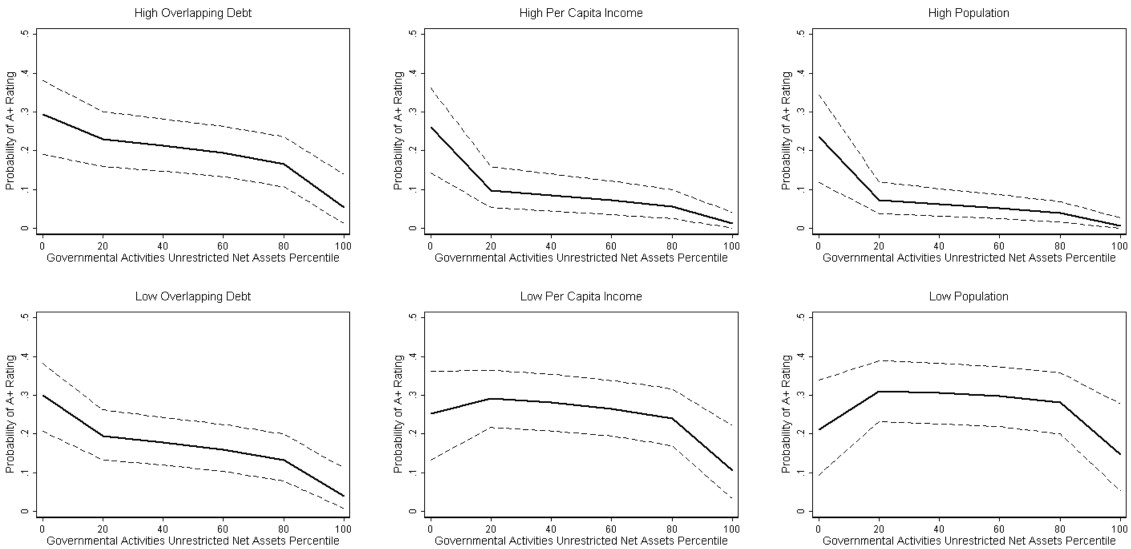
Table 1: Descriptive Statistics				
Variable	**Mean**	**Std. Dev.**	**Minimum**	**Maximum**
Slack Resources				
Reserved Fund Balance	45.43%	68.72%	0	44.16%
Designated Fund Balance	10.27%	20.52%	0	189.64%
Unreserved Fund Balance	22.86%	18.19%	-0.25%	101.82%
Unrestricted Net Assets	41.55%	49.52%	-165.07%	210.19%
Issue Characteristics				
Rating	6.277	1.647	2	9
Refunding Issue	0.097	-	0	1
Multi-Purpose	0.201	-	0	1
Lease	0.054	-	0	1
Issuer Characteristics				
Expenditure Volatility	21.68%	14.98%	3.51%	117.18%
Revenue Elasticity	0.624	0.468	-0.854	0.995
Intergovernmental Revenue	14.21%	14.31%	0%	77.94%
Per Capita Direct Debt	$656	$637	$0	$3,191
Per Capita Overlapping Debt	$1,516	$1,539	$0	$11,341
Per Capita Pension Obligation	$878	$1,249	$0	$8,558
Population	129,904	212,908	2,455	1,375,765
Per Capita Income	$23,782	$7,149	$11,084	$58,603
Council-Manager Government	0.783	0.413	0.000	1
N = 277				

Table 2: Credit Rating Descriptions and Sample Characteristics			
Moody's	S&P	Score	% of Sample
Aaa	AAA	9	9.35%
Aa1	AA+	8	14.75%
Aa2	AA	7	24.46%
Aa3	AA-	6	18.71%
Aa1	A+	5	16.55%
Aa2	A	4	11.87%
Aa3	A-	3	3.24%
Baa1	BBB+	2	0.72%
Baa2	BBB	1	0.36%
N = 277			

Table 3: Ordered Probit Estimates of Municipal Government Bond Ratings				
	Model I		Model II	
Variable	**Coefficient**	**Std. Error**	**Coefficient**	**Std. Error**
Slack Resources				
Unrestricted Net Assets	0.0066**	0.0016	0.0057**	0.0016
Total Fund Balance		-	0.0059*	0.0031
Reserved Fund Balance	0.0220**	0.0090	-	-
Designated Fund Balance	0.0010	0.0025	-	-
Unreserved Fund Balance	-0.0021	0.0041	-	-
Issue Characteristics				
Refunding Issue	-0.0675	0.2371	-0.0664	0.2331
Multi-Purpose	0.0563	0.1507	0.0693	0.1487
Lease	-1.5430**	0.3425	-1.4240**	0.3381
Issuer Characteristics				
Expenditure Volatility	-0.0001	0.0041	-0.0010	0.0043
Revenue Elasticity	0.0964	0.1367	0.1175	0.1366
Intergovernmental Revenue	-0.0044	0.0038	-0.0042	0.0036
Per Capita Direct Debt	0.0002	0.0001	0.0002	0.0001
Per Capita Overlapping Debt	-0.0001*	0.0000	-0.0001*	0.0001
Per Capita Pension Obligation	0.0001	0.0001	0.0001	0.0001
Population	0.7616**	0.0752	0.7770**	0.0761
Per Capita Income	2.7570**	0.3044	2.7355**	0.3014
Council-Manager Government	0.1215	0.1548	0.1278	0.1550
τ_1	33.106		33.201	
τ_2	33.848		33.929	
τ_3	34.907		34.976	
τ_4	35.733		35.797	
τ_5	36.457		36.515	
τ_6	37.505		37.561	
τ_7	38.545		38.609	
% Correctly Predicted	37.20%		37.90%	
N	277		277	
Log pseudolikelihood	-405.872		-407.072	
Wald χ^2	205.950**		186.63**	
* = p < .1, ** = p < .05				

Figure 1 - Slack Resource Effects on Credit Quality

Panel A: Predicted Probability of A+ Rating by Unrestricted Net Assets in the Governmental Activities



Panel B: Predicted Probability of AA+ Rating by Unrestricted Net Assets in the Gvml. Activities

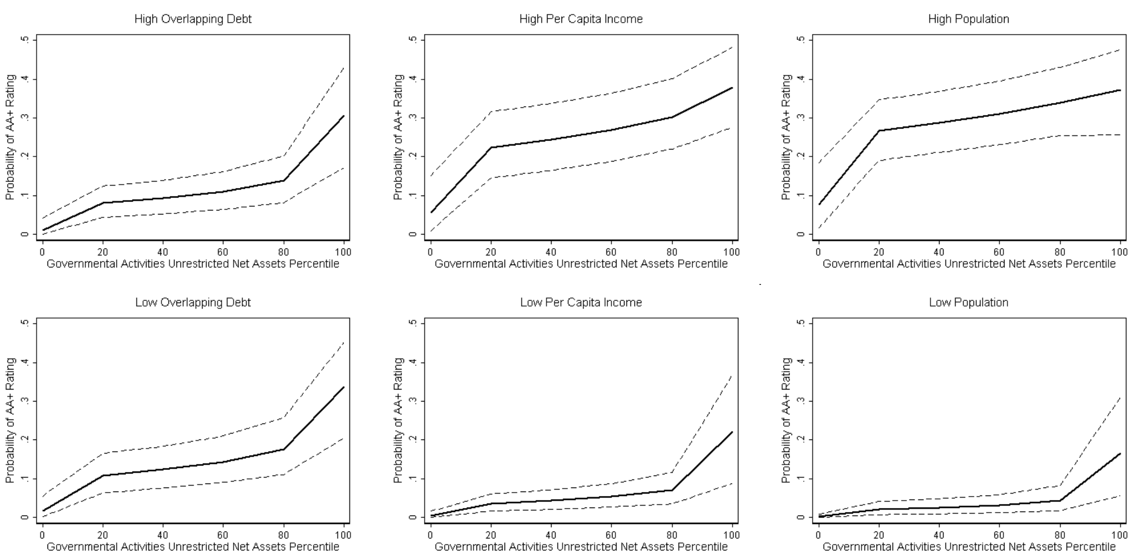
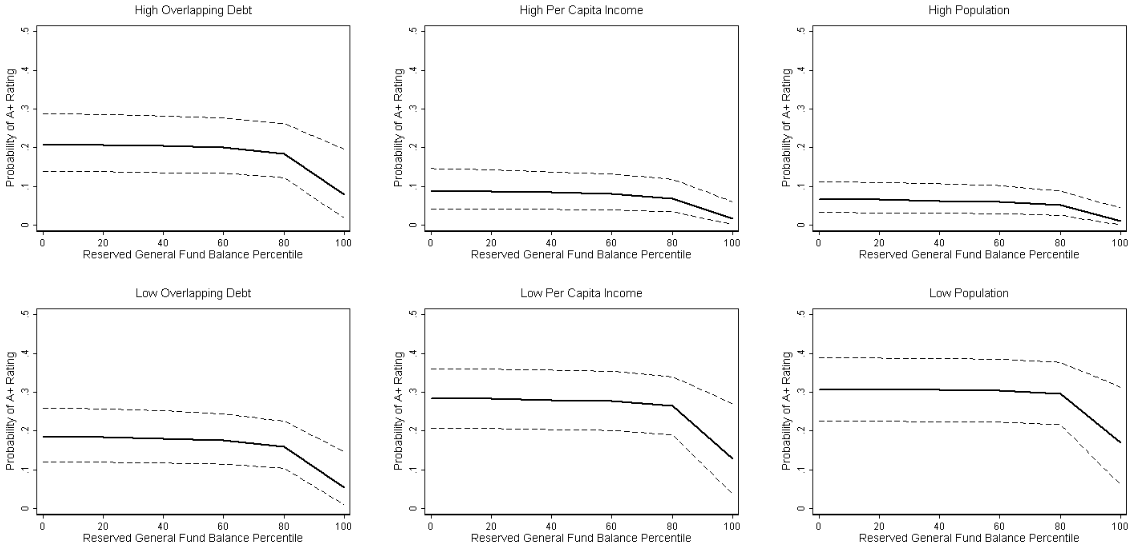


Figure 1 (cont.) - Slack Resource Effects on Credit Quality

Panel C: Predicted Probability of A+ Rating by Reserved General Fund Balance



Panel D: Predicted Probability of AA+ Rating by Reserved General Fund Balance

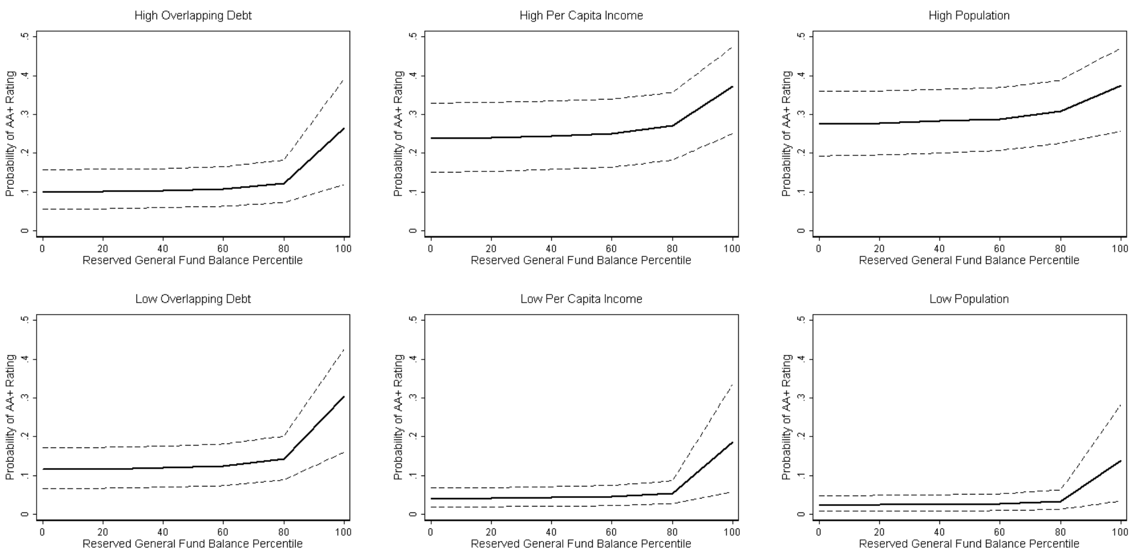
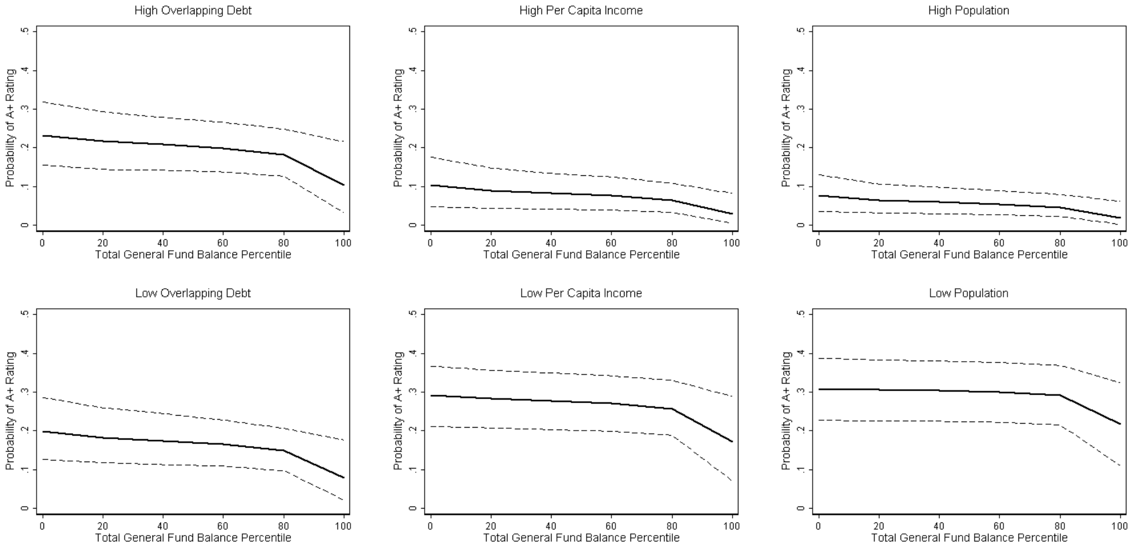


Figure 1 (cont.) - Slack Resource Effects on Credit Quality

Panel E: Predicted Probability of A+ Rating by Total General Fund Balance



Panel F: Predicted Probability of AA+ Rating by Total General Fund Balance