Subject: Why Debt Financing Will Reduce NVTA's Project Funding Capacity

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I have reviewed the report and presentation made by the PFM Group to the Northern Virginia Transportation Authority (NVTA) on July 24, 2013, titled "Overview of Financing Approaches, Executive Summary" (http://tinyurl.com/nvta20130724). Based on this review, I find that there are a number of significant errors in the report that lead to incorrect conclusions and recommendations.

Overview

The report begins by identifying seven key questions (p2), shown below, to be answered:

- What are the advantages and disadvantages of both debt and pay-as-you-go (PAYGO) funding approaches?
- Given the recommended PAYGO & debt project lists for FY2014, what would NVTA's financial profile look like?
- Under various scenarios, what is NVTA's long term funding capacity for debt & PAYGO approaches?
- What would be the key legal & credit provisions for an NVTA borrowing program?
- What is the impact/treatment of NVTA debt on member localities?
- What types of debt structures should NVTA consider? What are the alternatives to NVTA issuing bonds directly in its name?

The threshold question is whether debt financing would increase or decrease NVTA's project funding capacity. If debt financing increases project funding capacity, then debt financing should be pursued, but if debt financing decreases project funding capacity, then it should be avoided whenever possible.

PFM answers this threshold question directly on the page titled "PAYGO & Debt: Conclusions," which states that "Combining both PAYGO & debt leads to greater project funding capacity" (p28).

This answer is incorrect for reasons that I will explain.

Analysis

During my review of this report, I paid particular attention to the following pages:

- "Scenario A: No Debt" (p20);
- "Financial Profile of the Initial Validation Issue" (p14);
- "Scenario C: Limit Debt to a 2.0x Minimum Coverage" (p22);
- "Summary of Scenarios A-D" (p26).

The report properly sets out to answer the threshold question by comparing the Net Present Value (NPV) of the project funding capacity under PAYGO versus various debt scenarios. The fundamental problem with the report is the periodicity--the timing--of the cash flows. Critical to an accurate calculation of an NPV is the use of an appropriate discount rate, relevant cash flows, and correct timing of those cash flows.

Consider first “Scenario A: No Debt” (p20). The cash inflows equal NVTA's projected revenue over a 21 year period, beginning at $204 M in 2014 and rising to $339 M in 2034. The nominal (or future) value of this cash stream is $5.572 M, and the NPV of this cash stream is $4.502 M, discounted at 2.04 percent. The report incorrectly states that the discount rate is 4.08 percent, but the calculation is correct.

Consider next the "Financial Profile of the Initial Validation Issue" (p14). The cash flows presented in the report include NVTA's projected revenue over a 22 year period less debt service over 20 years, beginning at $204 M in 2014 and rising to $348 M in 2035, plus $91 M from bonds in 2014. The nominal value of this stream is $5,870 M and the NPV of this stream is $4,706 M discounted at 2.04 percent. This calculation is mathematically correct--it includes the relevant cash flows from the bond issue and all 20 years of debt service, though inclusion of the twenty-second year, 2035, is superfluous because the debt service ends in 2034, year 21.

Beyond the fact that year 22 is superfluous to calculating the NPV of this leveraged scenario, the additional year of $348 M in revenue makes the NPV of this scenario appear to be higher than the NPV of unleveraged Scenario A. In order to allow a direct comparison between these two scenarios, I have corrected the periodicity by removing the superfluous twenty-second year from the leveraged scenario. The result is that the NPV of the cash flows from the unleveraged scenario, $4,502 M, is $24 M higher than the $4,479 M from the leveraged scenario (figures don't add because of rounding).

I have been told that these two scenarios shouldn’t be compared because they were created for other purposes, but it doesn’t matter what the scenarios were prepared for. What matters is the interpretation of the best information that we have before us. This information is not at issue. What is at issue is how this information should be interpreted. The application of financial theory to the development of Net Present Value is well developed and accepted, but the calculations in the report deviate from that accepted application. My analysis merely applies accepted financial theory to the NPV calculations in order to allow a proper comparison.

When I turn my attention to "Scenario A: No Debt" (p20), to "Scenario C: Limit Debt to a 2.0x Minimum Coverage" (p22), and to the "Summary of Scenarios A-D" (p26), the problems of

periodicity become even more evident. As discussed above, an accurate calculation of an NPV requires use of an appropriate discount rate, relevant cash flows, and correct timing of those cash flows. As also discussed above, calculation of the NPV under the No Debt scenario is correct (not withstanding the stated 4.08 percent discount rate)--21 years, no bond income, no debt service, and a 2.04 percent discount rate. The NPV of Scenario C is incorrect because it doesn't include all the relevant cash flows, which consist of all inflows and outflows from PAYGO and leverage. Instead, Scenario C only includes the stream of inflows and outflows for 21 years, 2014 through 2034.

To make clear this error, consider the fact that Scenario C includes the inflow of $205 M from bonds in 2034 but doesn't include any outflow in payment for those bonds--it is as though the bond issue in 2034 represents free money. In order to correctly calculate an NPV for this scenario, the calculation would have to extend another 20 years to allow for the full repayment of these bonds.

One other factor that appears to be missing from the analysis in this report is the impact of a reserve level, mentioned on page 10 but apparently missing from the calculations. Without further information, I am unable to make any assessment as to the impact of such a reserve on NVTA's project funding capacity, but such a reserve would further reduce the NPV of the leveraged scenarios and an understanding of its impact should be developed.

Conclusion

A proper analysis shows, contrary to the conclusions in the PFM report, that combining both PAYGO & debt leads to lower project funding capacity. Important corrections to the list of "Advantages & Disadvantages of Debt" (p7) and "Advantages & Disadvantages of PAYGO" (p8) should be made. An additional disadvantage of debt is the fact that debt reduces the NPV of the project funding capacity and, conversely, an additional advantage of PAYGO is that the NPV of the project funding capacity is higher than under debt financing.

NVTA should be aware of this information and adjust its decisions accordingly.

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Qualifications

Stuart M. Whitaker has an MBA in finance and an undergraduate degree in economics from the University of Chicago. Mr. Whitaker has provided expert witness testimony and analysis in regulatory and other legal proceedings. Mr. Whitaker has provided financial analyses to the Internal Revenue Service (IRS), the US Navy, the Inter-American Development Bank (IDB), AT&T, British Telecom, Nippon Telegraph and Telephone (NTT), U S WEST, NYNEX, Northern Telecom, and the Canadian Trade Commission.