EVALUATION OF UNDERWRITER'S MUNICIPAL BOND PURCASE PROPOSAL (PREDETRMINATION OF THE PROCEEDINGS IN THE CASE OF EVENTUAL NEGOTIATED SALE OF MUNICIPAL BONDS IN THE CITY OF SHTIP)

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Abstract— There is some degree of misperception concerning the superiority of the competitive sale as the evidence suggests that large portion of municipal emissions take the form of negotiated purchase. The following article describes the procedure for negotiation of the eventual bond emissions in municipality of Shtip, Republic of Macedonia. The aim is to predetermine the most cost-effective method for evaluation of underwriter's municipal bond purchase proposal due to the substantial inexperience and deficit of expertise of the city's internal services. The literature offers various measures available to compare the relative costs of bond financing proposals. While net interest cost and net-present value are considered improper, it is thought that the best reliance for the purpose comes from the true interest cost method. The procedure incorporates calculation of true interest cost and duration of the underwriter's proposal and matching them with those for a sample group of similar bonds. In this particular case, as there are no other municipals to compare with, that would be the only available bond market index of the Macedonian Stock Exchange named OMB, with a portfolio completely made of long-term government securities.

Keywords— Municipal Bonds, Duration, Total Interest Cost, Negotiated Sale, Competitive Sale, Municipality of Shtip, Republic of Macedonia.

I. INTRODUCTION

The city of Shtip is already being established as the leading regional administrative, business and educational center in eastern Macedonia. The growth and expansion of the local and the regional economy have put pressure to the local government to secure additional financial resources to support the town's dynamic growth. Although a complete novelty, one of the options that's been seriously discussed recently, was the eventual municipal bond issues. For that reason, the Faculty of Economics offered a free consultation to the local authorities as part of the University's obligation for project participation, and ultimately a project was born. The ongoing project named "Municipal bonds as an alternative source of funding and effective management of collected funds for local economic development with special reference to Municipality of Stip", was meant as a certain guiding frame to sustain an effective decision making process for the local government if eventually a municipals issues were realized. Within the same project, two articles were already published covering different aspects of the same thematic, as for this one elaborates the procedure for negotiation of the eventual bond emissions. The aim is to resolve in advance the most cost-effective proceedings for evaluation of underwriter's municipal bond offerings. Here, we must notice that the results and the conclusion does not guarantee definite realization, and more likely, the article has the role of a "preparation tool". Yet, the ultimate decision concerning the municipal bonds emissions is left for the authorities.

II. NEGOTIATED VS COMPETITIVE SALE

Usually, there are two known marketing strategies available for the municipal bond issuers: the competitive, i.e., public sale, or a negotiated, i.e., private sale. A competitive bond sale requires bid solicitation from potential buyers, which are often the underwriters. The key feature of a competitive sale is that the principal redemption schedule, the coupon interest rates, and the structure of the bond issue are determined prior to the solicitation of competitive bids by the issuer [1]. Actually, this strategy resembles to a classical public auction where the bonds are sold to the buyer that is willing to pay the highest price, ensuring this way the lowest financing costs of the emission. It is very common during a competitive sale, the issuer to engage a financial expert and receive a professional assistance that includes evaluation of the bidding proposals and recommendation of the amount and structure of the emission. The advisor provides administrative and technical services as well such as the preparation of the official statements and even execution of the sales on the financial market. If we assemble the previous, the biggest advantage of competitive sale marketing strategy is the possibility to generate the lowest possible cost for the issuer due to underwriter's biding to investors that offer the highest paying price. This enables elimination of the inappropriateness of

the selection process, thus ensuring higher level of fairness. However, since there could be a lack of information about the bidder's financial condition, and there is no insurance if they'll be successful in the future, a risk premium may be introduced to the bidding price, resulting in decline on bidder's (underwriter's) long-term gross profit margin.

In a negotiated, private sale strategy, the underwriter is firstly selected, usually through the solicitation of competitive requests for proposals [2]. The biggest difference from the competitive sale is that in a private sale, all the terms from the bond issue are negotiated previously, between the issuer and the potential underwriter. This means that the terms such as the interest cost, the redemption schedule, the structure of bond issue including the underwriter compensation, are subject of discussion between the both parties, before the realization of the sale. The selection of the potential underwriter does not implicitly guarantee realization of the emission if the negotiation is unsuccessful. The advantages of this strategy is that the underwriter conducts most of the administrative tasks, thus avoiding the need for engagement of the financial advisor as a third party. This will decrease the floatation costs and the overall expense involved in selling the new securities. In addition, the underwriter often performs pre-sale marketing activities, including making contacts with other potential underwriters, thereby increasing the chance of trading the bonds with the highest possible price. Another preference is the flexibility to changes concerning the terms of sale especially the structure and the date of the issue. The major disadvantage of the negotiated sale is the absence of direct competition between the potential underwriters. Yet, this limitation could be relative since the underwriter selection in most of the cases is based on a previous business or personal relationship with the issuer.

There is no clear empirical evidence about the cost-effectiveness supremacy neither of the competitive nor the negotiated sale strategy and the first impressions from the literature reviews are rather mixed. For example, Simonsen and Robins detected a positive relationship between the competitive sale and the lower interest cost in their research during the 90-ies [3]. On the other side, Leonard investigated that negotiated bond offering that rely on more aggressive marketing strategies could indeed generate higher investment demand and lower interest cost [4]. In addition, based on the research on a large sample study, the same author confirms that there isn't any hard evidence that would indicate that financing costs on private sale differ from the costs on competitive sale. A similar conclusion comes from Stevens and Wood. Accordingly, neither of the both methods had primacy considering the criteria to generate the lowest total interest cost [5]. All of these empirical studies, reveal to some extent the strengths and weaknesses of the alternative sale methods, as well as their mutual relationship. And as there is continuous dispute for the most cost-effective methodological approach, the negotiated sale approach has stepped forward in front of the public sale method. In 1970, 83 percent of the municipals issues were sold competitively, and only 17 percent sold by negotiation. By 1994 approximately 80 percent of municipal bonds were sold by negotiation, and only about 20 percent were sold by competitive offerings [6]. Referring to the last, Leonard adds that the trend of increased utilization of the former method is consistent with the real image of the corporate bond market where large portion of bond sales are completed by negotiation [7]. In general, negotiated sale may not be a single strategy. More likely, it represents a range of private sale strategies distinguished on the basis of competitiveness of the underwriter's selection process [8]. This indicates that some negotiated sales may be equally competitive as the so-called competitive sales [9].

Having in consideration the advantages and disadvantages of the both alternative methods of sale, there are some practical recommendations to follow in which situation and when exactly to rely on them. According to the Government Finance Officers Association of the United States and Canada, a competitive sale is appropriate when: issuer has a strong underlying credit rating at least in the "A" category; there's a case of emission of general obligation bonds or full faith obligations (e.g. alternate revenue bonds or debt certificates); structure of bond issue does not include special features that would require extensive explanation to the market; and, issue size is conducive to attracting investors. On the other side, a negotiated sale is more appropriate when: issuer has a credit rating lower than "A"; bond insurance is unavailable, debt structure is complicated; issuer wants input in how bonds are allocated among underwriting firms; and, issuer wants to target retail investors [10].

III. THE PROPOSED PROCEDURE

In the following lines we present the proposed procedure during the negotiation process of eventual bond issues shortly, according to Glen Stevens [11]. The intention is to evaluate a potential underwriter municipal bond purchase proposal in the terms of cost efficiency.

Step no. 1. ***Computing the duration and total interest cost – TIC of the purchase proposal.*** On the day a negotiated bond offering is approved and the purchase proposal is announced from the potential underwriter, the first step that should be done by the issuer of municipal bonds is calculation of duration and TIC of the received purchase proposal. The concept of duration has twofold meaning in the context of bonds. The first one relates to a measurement of how long, in years, it takes for the

price of a bond to be repaid by its internal cash flows. In order to express the duration in reference with this meaning, we may use the so-called Macaulay duration, which is the most common measurement of duration of bonds and the only form of duration quoted in years. Developed in 1938 by Frederic Macaulay, it measures the number of years required to recover the true cost of a bond, considering the present value of all coupon and principal payments received in the future [12]:

$$Macaulay \quad Duration = \frac{\sum_{t=1}^{n} \frac{t \times C}{(1+i)^t} + \frac{n \times M}{(1+i)^n}}{P} \tag{1}$$

where n = number of cash flows, t = time to maturity, C = cash flow, i = required yield to return (discount rate), M = (serial) maturity par value, P = internal bond price.

Duration is an important measure for investors to consider, as bonds with higher durations carry more risk and have higher price volatility than bonds with lower durations. That's why the other significance of duration is the one as a measure of interest rate risk in bond investing. In general, the sensitivity of a bond's value to changing interest rates depends on both the length of time to maturity and on the pattern of cash flows provided by the bond [13]. To take care for this purpose, we can use the Modified duration which is an expanded (modified) version of the Macaulay duration. It reflects the percentage change in a price of bond for a 100 basis point change in interest rates by including the frequency of coupon payments [14].

$$Modified \quad Duration = \left[\frac{Macaulay \quad Duration}{\left(1 + \frac{ytm}{n}\right)} \right] \tag{1}$$

where n = number of coupon periods per year and ytn = yield to maturity.

As we can see, there is a connection between the Macaulay duration and modified duration. But despite the close relationship among them, we must have in mind that they are actually conceptually distinct. While Macaulay duration represents the average time until repayment expressed in units of time, for example years, the modified duration envelops the price sensitivity of a bond when its price is treated as a function of yield.

The previous measurements assume that the expected (the projected) cash flows will stay constant even if the interest rates change during time, which is the case of option-free bond instruments. For the ones with embedded options for example as the callable bonds, the Modified duration will not represent an adequate approximation of the movement of price. To determine the price of such bonds, it's necessary to apply the option pricing approach (option-adjusted spreads method). More accurate approximation to this is the effective duration, which is considered as a discrete approximation to the slope of the bond's value as a function of the interest rate [15]:

$$Effective \quad Duration = \frac{V2 - V3}{2 \times V1 \times \Delta y} \tag{3}$$

where V1 = initial price of the bond, V2 = price of the bond if yields decline by Δy, V3 = price of the bond if yields rise by Δy and Δy = percentage change in yield expressed in decimal.

Another important issue during the first step is the calculation of the overall financing costs. Calculating the financing costs of a municipal bond issue is not an easy task at all for several reasons: first, most municipal bond are issued with serial maturities which means that a portion of the principal payment is redeemed in each period during the life of a bond; second, much of the municipals are sold with premiums or discounts (for example if the offered coupon rate at the moment of the sale is lower than the established market interest rate, resulting in original issue discount), and third, it is very common that these bonds carry different serial coupon rates, making the calculation even more complex [16]. Many methodologies help determine the borrowing cost of bond issue, but only one is found to perform satisfactory for the purpose and that is the True Interest Cost method (TIC). Its strengths mitigate the weaknesses of alternative methods: unlike the Net Interest Cost, it incorporates time value of money; on the contrary of Net Present Value it yields an internal rate of return surpassing the problem with the choice of discount rate. It is defined as the interest (internal) rate necessary to equalize the present values of the issuer's future cash payments, i.e., principal and interest payments (including the accrued interest), with the net proceeds of the bond issue. [17]. The target value for the present value calculation of TIC is the net proceeds constructed as par value adjusted for any premiums or discounts, credit insurance and underwriter's discount. The target value for calculation of the more strict All-in-TIC measure, includes the cost of issuance expense above the rest [18]. Table 1 illustrates the calculation of net proceeds for TIC and All-in-TIC measure and Table 2 gives further insight of the expense components included in borrower's cost of issuance and underwriter's discount expense.

Table 1. Net proceeds elements for TIC and All-in-TIC measure

Net Proceeds Elements for TIC:	Net Proceeds Elements for All-in-TIC:
Par Value +/- Premium/Discount - Bond (Credit) Insurance - Underwriter's Discount	Par Value +/- Premium/Discount - Bond (Credit) Insurance - Underwriter's Discount - Cost of Issuance Expense
= *Net Proceeds*	= *Net Proceeds*

Source: Taylor, P., Koch, M. (2008). Introduction to Bond Math: Presentation to CDIAC. California Debt and Investment Advisory Commission – CDIAC, Barclays Capital, p. 40.

Table 2. Issuance expenses elements

Borrower's Costs of Issuance	Underwriters' Discount
Rating agency fees Issuer/ Authority fee Bond counsel fee Borrower's counsel fee Trustee fees Auditor's fee Printing and mailing costs Miscellaneous and contingency	Takedown Management fee Underwriters' counsel DTC CUSIP BMA assessment Dalcomp Electronic order entry Dalcomp wire charge Cal PSA CDIAC Day loan Out-of-pocket and closing costs Verification agent (if refunding)

Source: Taylor, P., Koch, M. (2008). Introduction to Bond Math: Presentation to CDIAC. California Debt and Investment Advisory Commission – CDIAC, Barclays Capital, p. 30.

If for example, the underwriter's proposal has par value of 2.000.000 euros, expected life of 10 years, with serial redemption of 200.000 euros for each year starting from 01.01.2018 until 01.01.2027, delivery date on 15.11.2016 and variable coupon rate, then the internal cash flows from the proposed municipal bond issue are presented as follows in the Appendix in Table 3. (bond insurance cost, underwriter's discount and cost of issuance are assumed at 2,5%, 3,0% and 2,0% from nominal value subsequently).

Step no. 2. ***Computing the duration and TIC of a cohort group of bonds, a sample of similar bonds marketed recently.*** It is very important to gather information and accomplish the same calculations for the key variables from the most closely related securities in the market for comparison purposes. Usually those refer to the municipal bonds issued by public authorities within the same branch (for example water management authorities, school districts, local government authorities etc.) with similar principal amounts, maturities and credit ratings. This practice is very common to the advanced countries with developed, very organized, structured and massive financial markets (large part of the municipal bonds issued in the US are listed on the specialized Bond Buyers Index, the so-called BBI) In our case, due to the poorly developed market without any registered municipal bonds issues, the choice is justifiably limited only to the securities that participate in the Macedonian index of listed bonds, the so-called OMB index (originally: ОМБ – Индекс на обврзници на Македонската Берза). The OMB index represents a consistent reference pricing measure defined as weighted average price of the official Macedonian long-term bond portfolio consisted from the central government's denationalization bonds. There are in total 10 separate issues included in the OMB index starting from the sixth to the fifteenth denationalization bond emission. The basic futures of the individual bond issues are shown in the Appendix in Table 4. The results of the performed calculations (price, discount, accrued interest, Macaulay duration, modified duration, effective duration, net proceeds and All-in-TIC) are presented also in the Appendix in Table 5.

Before we proceed any further, we have to consider some relevant notes for the following elements of calculation. First, all bond issues have expected average life of 10 years and equal coupon rates of 2%. The government of the RM retains the right to recall the bonds from the investors if the market conditions are not favorable. The rate of redemption of the par value is determined at 10% for each year according to the defined time schedule. The yield to maturity (ytm), or the required rate of return which is defined as the opportunity cost of the alternative investment, and plays the role of discount rate, is actually the government's long-term securities market interest rate. The price is the internal price of assumed 100€ face value of a security's expected cash streams during its life. The Macaulay duration is derived according to (1), while the modified and the effective duration are computed according to (2) and (3). Bond's discount is defined as negative difference between its par value and price at the moment of issue and is primarily determined between the relation of the coupon and the market interest rate (ytm). It is very obvious that during the period of the financial crisis the long-term market interest rate was established at very high level, thus generating large discounts depreciating the net proceeds of the relevant bond issues. It is computed respectively as:

$$Discount = ParValue \times \left(1 - \frac{Price}{100}\right) \quad (4)$$

According to the definition, accrued interest is the interest on a bond that has accumulated since the principal investment, or since the previous coupon payment if there has been one already. In our case it occurs from the first transaction on the date of issue up until the first coupon payment, which means that it

takes into account all the days from the settlement date:

$$Accrued\quad Interest = \frac{Par\quad Value \times Coupon\quad Rate}{100} \times \frac{Days\quad Until\quad First\quad Coupon}{360} \tag{5}$$

We calculated the net proceeds according to the more restrictive scheme for All-in-TIC measure from Table 1. It is assumed for every separate issue that bond insurance cost, underwriter's discount expense and the cost of issuance are established at 0,5%, 1%, and 0,8% from nominal value respectively. And finally, All-in-TIC measure is defined as the internal rate of return that adjusts the net proceeds and the internal cash flows of the bond to zero.

Step no. 3. ***Running a regression model and constructing the "line of best fit".*** We can utilize the assembled data for the Macaulay duration and the All-in-TIC measure in a simple regression model and derive the predicted TIC for the proposed bond purchase offering. The simple regression is constructed as:

$$Y = (\alpha) + (\beta) X \tag{6}$$

If we take the measure of ALL-in-TIC as dependent variable and the duration measure as independent variable, then the regresion will take the form:

$$All - in - TIC = (\alpha) + (\beta) Mac.Dur. \tag{7}$$

By pairing the representative variables, the regression yields the following result:

$$Predicted\ (All - in - TIC) = (0{,}755507) + (-0{,}14122) Mac.Dur. \tag{8}$$

Step no. 4. ***Comparing the predicted TIC with the one from the underwriter's proposal.*** Based on the comparison, the issuer could implement an appropriate strategy during the process of negotiation [19]. For example, if the overall effective cost is significantly higher, the issuer should ask for reasonable arguments from the underwriter that would explain the difference. If the negotiator fails to provide hard evidence, the next step would be to bargain for higher price. If noting from the previous demands happens, then the choice of the issuer is restricted to the following tactics: to delay or cancel the forthcoming bond issue (if the issuer is in advanced position to negotiate or if the need for liquidity is not so urgent), or accept the higher costs of the underwriter's bond offering (this option is justified only if the need for money is pressing or the issuer's negotiating rang is inferior).

If we go back on our example, it is clear that All-in-TIC of the proposed issue from the underwriter is determined at 5,70% (Table 5 under reference Shtip). The predicted All-in-TIC of the examined representative group of bonds is calculated at 0,0535 or 5,35% [0,755507 + (-0,14122)x4,971]. Evidently, the proposed effective cost falls to the zone of rejection of the underwriter's proposal since the proposed TIC is higher than the predicted one. Obviously, this case would be an adequate criteria in the countries with advanced financial markets. But, in the case of Macedonia, without any history of municipal bond issues, we suggest more flexible approach in the application of the presented criteria. Namely, since all of the cohort group securities are made of long-term government bonds with higher class in terms of credit quality, it is useful to simply add a very small percentage point on the reference criteria in order to express objectively the lower credit quality of the forthcoming municipal bond issue. For example if we calculate with 0,5% risk margin as a precaution measure, the predicted TIC will become 5,85% (5,35+0,5), then the proposed effective cost will automatically slip into the acceptance zone and the underwriter's offer will be considered as favorable in the terms of cost efficiency.

However, a difference in the effective financing cost and the one that has been predicted could indeed indicate on the following problematic issues [20]. The first indication is concerned on the issuer's rating quality and the level of the credit risk associated with it. The credit quality of the issuer might not be satisfactory which may in turn cause the overall cost to rise due to the incorporated higher risk premiums. Next, there could be an increased level of competition of municipal bond offerings for sale. It is quite possible that the bond market is "saturated" at the critical moment with higher than common supply of similar bond emissions. And finally, if a significant divergence in price is detected, it could be result of inappropriate (unfavorable) price offer. The underwriter's fees and interest rates might be pre-calculated excessively high which will conclusively produce unreasonable price offer. That's why it is important to use the approach of predicted TIC: it improves the negotiating position of the issuer and enables him to question and confront the underwriter's bond purchase proposal.

CONCLUSIONS

This article presents the proceedings in the case of negotiation of eventual bond emissions in municipality of Shtip, Republic of Macedonia, and predefines the most cost-effective method for evaluation of underwriter's sale proposal for the same purpose. The proposed procedure is consisted from 4 basic steps: computing the duration and TIC of the purchase proposal; computing the duration and TIC

of a cohort group of bonds; running a regression model and constructing the predicted TIC of the representative group of bonds; and comparing the predicted TIC with the one from the underwriter's proposal. These proceedings allow the issuer to apply an appropriate strategy during the process of negotiation and enable him to question and confront the underwriter's bond purchase proposal.

APPENDIX

Table 3. Internal cash flows of the proposed local government bond issue in municipality of Stip

Date	Interest basis	Interest rate	Interest	Redemption	Cash flow
01.01.2018	2.000.000	3,00%	67.500	200.000	267.500
01.01.2019	1.800.000	3,20%	57.600	200.000	257.600
01.01.2020	1.600.000	3,40%	54.400	200.000	254.400
01.01.2021	1.400.000	3,60%	50.400	200.000	250.400
01.01.2022	1.200.000	3,80%	45.600	200.000	245.600
01.01.2023	1.000.000	4,00%	40.000	200.000	240.000
01.01.2024	800.000	4,10%	32.800	200.000	232.800
01.01.2025	600.000	4,20%	25.200	200.000	225.200
01.01.2026	400.000	4,30%	17.200	200.000	217.200
01.01.2027	200.000	4,40%	8.800	200.000	208.800

Source: Author's calculations.

Table 4. Basic features of the individual bond issues listed on the OMB index

Issue No.	Par value (€)	Date of issue	Coupon (annual)	Options	Redemption dynamic (1/10 from par value)	Ytm
6-th	18.000.000	01.03.2007	2%	callable	01.06.2008-01.06.2017	11,8%
7-th	30.000.000	25.08.2008	2%	callable	01.06.2009-01.06.2018	11,8%
8-th	23.000.000	06.04.2009	2%	callable	01.06.2010-01.06.2019	11,6%
9-th	30.000.000	21.04.2010	2%	callable	01.06.2011-01.06.2020	8,6%
10-th	11.000.000	30.03.2011	2%	callable	01.06.2012-01.06.2021	6,2%
11-th	10.000.000	14.05.2012	2%	callable	01.06.2013-01.06.2022	6,2%
12-th	13.000.000	22.05.2013	2%	callable	01.06.2014-01.06.2023	5,3%
13-th	10.000.000	05.08.2014	2%	callable	01.06.2015-01.06.2024	5,0%
14-th	9.500.000	01.06.2015	2%	callable	01.06.2016-01.06.2025	3,5%
15-th	12.000.000	20.06.2016	2%	callable	01.06.2017-01.06.2019	3,7%
Shtip	2.000.000	15.11.2016	variable	callable	01.01.2018-01.01.2027	4,0%

Source: Macedonian Stock Exchange – Prospects of the individual bond emissions; Author's example.

Table 5. Price, discount, accrued interest, Macaulay duration, modified duration, effective duration, net proceeds and All-in-TIC for the cohort group and proposed bond issue

Issue No.	Price (100 €)	Premium /Discount	Accrued interest	Mac. dur.	Mod. dur.	Eff. dur.	Net proceeds	All-in-TIC
6-th	64,709	(6.352.380)	450.000	**4,437**	3,969	3,972	11.233.620	**12,72%**
7-th	63,839	(10.848.300)	458.333	**4,484**	4,011	4,014	18.461.700	**12,73%**
8-th	65,046	(8.039.420)	529.000	**4,460**	3,996	4,000	14.431.580	**12,51%**
9-th	73,586	(7.924.200)	665.000	**4,675**	4,305	4,309	21.385.800	**9,34%**
10-th	81,962	(1.984.180)	256.667	**4,847**	4,564	4,569	8.762.820	**6,83%**
11-th	81,731	(1.826.900)	208.889	**4,858**	4,574	4,579	7.943.100	**6,83%**
12-th	85,164	(1.928.680)	265.778	**4,928**	4,680	4,685	10.772.320	**5,89%**
13-th	85,986	(1.401.400)	163.889	**4,969**	4,732	4,738	8.368.600	**5,58%**
14-th	92,785	(685.425)	190.000	**5,070**	4,898	4,904	8.596.075	**4,02%**
15-th	91,776	(986.880)	226.667	**5,059**	4,878	4,884	10.737.120	**4,22%**
Shtip	98,112	(37.760)	67.500	**4,971**	4,780	4,785	1.888.240	**5,70%**

Source: Author's calculations.

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