

The 2nd Annual Conference of PECC Finance Forum

Issues and Challenges for Regional Financial Cooperation in the Asia-Pacific

Hilton Hua Hin Resort & Spa, Hua Hin, Thailand

July 8-9, 2003

SessionIII : Developing Regional Bond Markets in East Asia: Issues and Proposals

Background Paper

**The Asian Bond Bank :
A Good Idea to Explore for Credit Enhancements**

S. Ghon Rhee

K. J. Luke Distinguished Professor of Finance
University of Hawaii

And

Gregory R. Stone

The Asian Bond Bank: A Good Idea to Explore for Credit Enhancements

June 2003

S. Ghon Rhee and Gregory R. Stone*

*Both at the University of Hawaii

Contact Author:

S. Ghon Rhee, Ph.D.
K. J. Luke Distinguished Professor of Finance
University of Hawai'i
2404 Maile Way, C-304
Honolulu, Hawai'i 96822-2282
U.S.A
e-mail: rheesg@hawaii.edu
web site: <http://www2.hawaii.edu/~rheesg>

*This paper is prepared as a background reference material for the Second Annual Conference of the PECC Finance Forum on "Issues and Challenges for Regional Financial Cooperation in the Asia-Pacific" in Hua Hin, Thailand on July 8-9, 2003.

The Asian Bond Bank: A Good Idea to Explore for Credit Enhancements

1. Introduction

The rate of interest paid by borrowers is highly dependent upon the structure of the loan and the creditworthiness of the borrower. The structure of the loan is often determined endogenously whereas the credit rating tends to be determined exogenously. Several methods of credit enhancement exist. This paper will discuss one of the most frequently overlooked methods, the bond bank.

Municipal bond banks first appeared in Canada in 1956 and in the United States in 1970 for the express purpose of lowering the cost of debt for municipalities. Since that time, municipal bond banks have been offering a unique and advantageous way for small communities to finance municipal projects. We believe a similar model can be applied to enhance credit ratings and reduce borrowing costs for Asian governments as well.

In the United States and Canada, many small municipalities lack knowledge of financial markets and need to borrow relatively small amounts of capital, the process of hiring an investment bank and floating a small amount of what will be an illiquid, and possibly un-rated debt issue, can significantly increase the cost of borrowing for the municipality. Historical, structural and current financial problems have contributed to low credit ratings in many Asian countries. The enhancement of credit ratings results in lower borrowing costs and therefore improved growth and wealth for countries that receive. In the United States and Canada, small or poorly rated municipalities face similar borrowing problems. One improvement available to many municipalities is the municipal bond bank (MBB). The MBBs operate as credit enhancing organizations by “pooling”

multiple municipalities' borrowing needs into a single bond bank debt issuance, thereby modifying two important characteristics of the municipality's debt.

First, the credit rating associated with the debt is changed. Municipal bond banks must have strong credit ratings if they are going to fulfill the purpose for which they are intended. Bond banks operate by re-lending the funds obtained with their higher credit rating to the municipalities with lower credit ratings. This process is called "credit rating arbitrage." Credit rating arbitrage may be useful to many Asian countries. As can be seen below, the credit ratings of many Asian countries could benefit from improved credit ratings.

Table 1: Sovereign Credit Rating

Economy	Local Currency	Foreign Currency
China	—	BBB
Hong Kong SAR	AA-	A+
India	BB+	BBB
Indonesia	BB+	B-
Korea	A+	A-
Malaysia	A+	BBB+
Mongolia	B	B
Philippines	BBB	BB
Singapore	AAA	AAA
Taipei, China	AA-	AA-
Thailand	A-	BBB
Vietnam	BB	BB

Source: Standard & Poor's (June 2003)

The second characteristic modified by a MBB debt issuance is the size of the issue. By "pooling" multiple municipalities borrowing needs together, MBBs are able to

offer larger debt issues, which typically make the primary market offering more competitive. With more competition in the primary market, one expects the price of the bond to rise and the municipality's debt servicing cost to fall. Savings is also realized through a reduction in transaction costs associated with the economies of scale in the underwriting process. Savings from the anticipation of increased liquidity in the secondary market due to the increased size of the offering may also occur. MBBs typically offer professional management and minimal administrative costs to their members as well. Increased size and liquidity may benefit the smaller Asian countries or countries which infrequently or irregularly issue debt.

At least three empirical studies have attempted to quantify the impact MBBs have had on US municipalities' borrowing costs [Cole & Millar (1982), Katzman (1980), Kidwell & Rogowski (1983)]. These studies have indicated that municipalities with credit ratings below that of the regional MBB realized savings from both an improvement in the credit rating and the economies of scale associated with the underwriting process. Municipalities with credit ratings equivalent to the MBB typically realized no savings from credit rating arbitrage, but did save in the underwriting process. Municipalities with credit ratings higher than the MBB realized no benefit from bond bank participation.

Unlike most governmental organizations, MBBs have helped municipalities without imposing a financial burden upon the taxpayer. Most MBBs operate efficiently enough to reduce the municipality's cost of debt while simultaneously paying for their own operations. The Bond Bank of Alaska has produced excess returns to the state every year since 1977 for a cumulative \$23.2 million.¹ This sum is more than the State of Alaska's original investment in the bond bank of \$18.6 million, and while this may seem

¹ Alaska Bond Bank 2001 Annual Report

a relatively poor rate of return on capital, it must be kept in mind that MBBs are not run as for-profit operation. Rather the bond bank's primary purpose is to pursue lower cost loans for the state's municipalities. The Alaska Bond Bank secured over half a billion dollars of funding for Alaskan communities and in the year 2001 alone, the bond bank issued \$50 million in debt and saved the communities an estimated \$4million in reduced interest costs. The turning of a small profit, while reducing the cost of debt, only emphasizes the magnitude of the efficiency gains that these organizations produce.

This paper gives a broad overview of how MBBs operate and the potential problems associated with them. In Section 2, we examine structural differences between various types of bond banks. Though similar in objective, MBBs operate in various ways, not only between countries, but between different states as well. Section 3 discusses how bond banks operate in general and describes the typical US MBB debt issuance process. This section also discusses different amortization methods and some of the additional flexibility, such as the use of swaps and municipal bond insurance, that some MBBs offer their municipalities. Section 4 examines who benefits the most from bond bank participation. Since municipalities differ in their size and stand-alone credit ratings, MBBs have various savings effects depending upon the particular circumstance of the municipality. This section also discusses the potential for hidden costs and the issue of moral hazard. Section 5 discusses cooperative borrowing in Europe and the difficulty of enticing the larger, better-rated communities to join bond banks. The last section discusses the potential applications of the bond bank model to Asia and contains the conclusions of this paper.

2. Differences between Canadian and US bond banks

With the exception of the Municipal Finance Authority of British Columbia (MFABC), bond banks in Canada are called Municipal Finance Corporations (MFCs). For the purposes of this paper, MFCs and the municipal bond banks of the United States will generically be referred to as MBBs, though some differences exist between the Canadian and US institutions. A few of the significant differences are as follows: (i) with the exception of the MFABC, the senior Canadian government directly guarantees MFC loans. Whereas in the US, senior governmental guarantees are only available on debt issued through the Maine Municipal Bond Bank and the Vermont Municipal Bond Bank; (ii) in Canada, with the exception of a few large cities, municipalities located in MFC jurisdictions are required to use MFCs. Whereas in the US, it is entirely at the discretion of the municipality whether or not to issue debt through the regional bond bank; and (iii) some MFCs have issued debt in foreign currencies; whereas US bond banks have only issued debt in US dollars.

Because of the structure of the MFCs, in particular the senior governmental guarantee of debt and the requirement for municipality participation, this paper focuses on the US MBB model. It is believed that the Canadian practices obscure one of the more interesting accomplishments of bond banks, synergistic credit enhancement.

If an MBB operates as an extension of the senior government, then MBB debt issues are senior governmental debt issues and an MBB debt issuance should directly result in an increase in the province's overall debt load and should marginally increase the province's cost of capital and could be viewed as an inter-governmental transfer rather

² For a list of bond banks found by the author, please see Appendix 1.

than an improvement in efficiency. This model seems inappropriate for an Asian Bond Bank that lends its credit rating to sovereign governments. Rather than the unrealistic assumption that sovereign Asian governments would willingly assume the debt of other Asian nations, and the moral hazard problems associated with this, we believe the more interesting and important insights gained from the study of MBBs are in the examination of their stand-alone efficiency enhancements, thought to be more distinguishable in the US MBB model.

MBBs are structured in a variety of different of ways. Because individual bond banks are designed to exploit the cost saving inefficiencies present in their particular region, bond banks try to organize themselves in such a manner as to focus on their region's greatest inefficiency. Typically, this means focusing the bank's operations to take advantage of either the potential for credit rating arbitrage or the size of the debt issue aspect. Therefore, two broad generalizations can be used to describe bond bank structures.

In one structure, the MBB issues "Revenue Bonds" in the national bond market using its own name and purchases the "General Obligation Bonds" (GOBs) of the municipality.^{4,5} When operated this way, MBBs pass the debt service costs through to the municipalities and the term structure of interest rates for the municipalities is equal to

³ MBB's bonds are revenue bonds because of the source of their principal and interest payments are the cash flows generated by the municipalities.

⁴ MBB's bonds are revenue bonds because of the source of their principal and interest payments are the cash flows generated by the municipalities.

⁵ Investigation into the proceeds generated by revenue bonds versus the proceeds generated by GOBs (GOBs tend to enjoy a lower interest rate than comparable revenue bonds) have found that the savings from bond bank participation have surpassed the losses of issuing revenue bonds instead of GOBs. Additionally, MBBs will often incorporate a municipality's revenue bonds in its debt offering.

that of the MBBs [Cole & Millar (1982)]. This allows the municipality to take advantage of the credit rating arbitrage process.

In the second operating structure, the MBB ascertains the borrowing needs of the municipal applicants together and issues debt in one large “pool,” taking advantage of the increased size of the issue. These different MBB structures can be seen in Figures 1 and 2, respectively, on the following page.

3. How US MBBs Operate

In the US, to be eligible for bond bank participation, municipalities must first undergo their required jurisdictional obligations for issuing debt. This usually requires obtaining either the approval of the citizens or approval from the bond counsel. The municipality then submits an application to the MBB.

When making a decision as to whether to include a certain municipality’s debt,⁶ MBBs examine the same information as the credit ratings agencies. Issues such as the amount of the bond, if the issue was publicly voted on, what assets or taxes, in addition to property taxes, are being pledged, the project feasibility study, the intended sources and uses for the bond bank’s funds, the municipality’s current outstanding debt, any previous defaults by the municipality, the local economy, the largest employers, the population figures, property tax statistics, the current years’ budget, etc. all effect the bond bank’s decision. Once the bond bank decides to accept the municipality into the debt pool, the municipality’s pays the same rate of interest on the borrowed funds as all the other municipalities involved in that debt issuance. That is, after being accepted, the

⁶ In the US, MBBs typically have the authority to exclude a municipality if it is felt such a municipality would significantly detract from the marketability of its bonds. An example where an MBB might not want to include a certain municipality's debt is if the municipality's borrowing needs were very large, swamping the MBB's credit capacity and thereby damaging its ability to serve other municipalities.

Figure 1. A Bond Bank Focused on the Credit Rating Effect

(Source: *Government Finance Review*, June 1988)

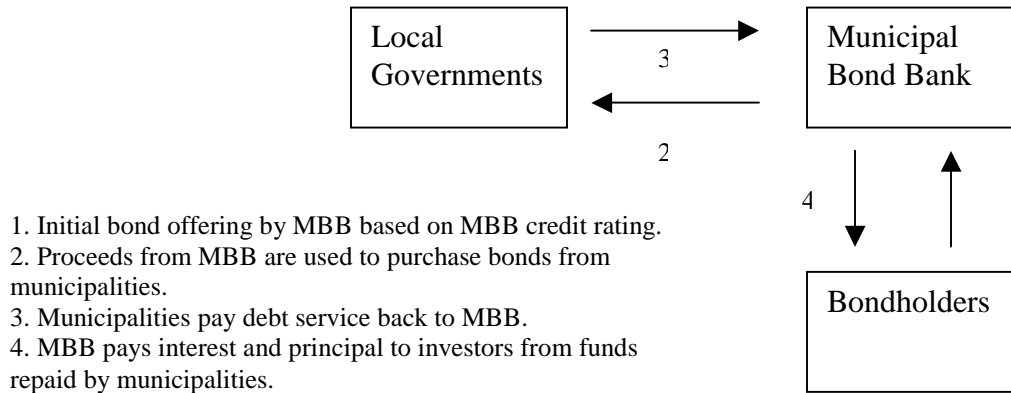
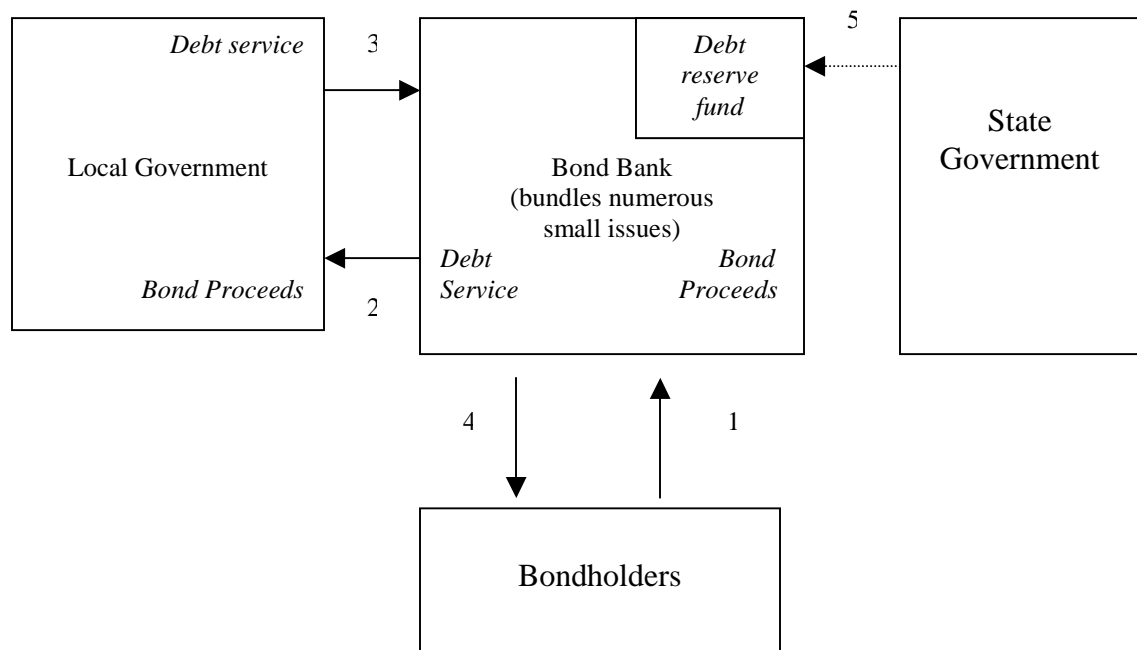


Figure 2. A Bond Bank Focused on the Size of Debt Issue

(Source: *Government Finance Review*, June 1988)



municipality's credit rating ceases to be a distinguishing factor. For an Asian Bond Bank, adjustments could be made depending upon sovereign credit rating, an Asian credit rating agency or using a system of *tranches* of bonds with different cash flow priorities (Rhee, 2003).

When the MBB has accumulated a sufficient amount of debt or the regularly scheduled debt issuance date arrives, the bank floats the issue and in some cases, an additional 10% designated for a reserve or sinking fund. This reserve fund helps lower the cost of debt by reducing the default risk faced by investors. The reserve fund is typically equal to one year's worth of principal and interest payments and can be used in the event of slow pay or default by a municipality [Cole & Millar (1982)]. The reserve fund is invested in Treasury Securities (Katzman, 1980) and "the interest rate spread between the return on taxable government securities and the tax-exempt bond bank issues is an arbitrage profit for the bond bank" [Kidwell & Rogowski (1983)].

In order of priority, the collateral behind the MBB's debt issues are the reserve fund, the full faith and credit of the municipality, a possible lien on state grants in aid to municipality or an "intercept mechanism," and finally the moral obligation of the state to replenish the reserve fund in case of depletion. Because states typically offer only their moral obligation, MBBs have generally received a credit rating one-notch below senior governmental authority [Katzman (1980)].

Because the MBB is raising funds for the municipality to use in a municipal project, MBB issues are often free from federal and in many cases state and local taxes.

⁷ In the US, MBBs typically have the authority to exclude a municipality if it is felt such a municipality would significantly detract from the marketability of its bonds. An example where an MBB might not want to include a certain municipality's debt is if the municipality's borrowing needs were very large, swamping the MBB's credit capacity and thereby damaging its ability to serve other municipalities.

This helps reduce the municipality's debt servicing costs but still attracts investors with equivalent after tax returns.

While requiring the municipality to pay back the principal and interest over the useful life of the asset, some MBBs offer flexibility in their amortization schedules. The Maine Municipal Bond Bank allows a municipality to “structure the principal repayments however they would like as long as it coincides with the useful life of the asset being financed.”⁸ The debt issued by the MFABC is in the form of “bullets,” debt that cannot be called and is due only at maturity.⁹ The MFABC and the Bond Bank of Vermont use a level debt service (equal principal and interest payments each year).¹⁰

The MFABC also offers increased flexibility to its municipalities by allowing them to participate in interest rate swaps, in particular Forward Starting Swaps. This flexibility gives the municipality the ability to lock in an affordable rate of interest before the MFABC makes its bi-annual debt issuance, thereby hedging against a potential rise in interest rates. In addition, access to the swaps market allows the municipality to lock in a fixed rate of interest for a longer or shorter term than the standard MFABC 10-year bond issue.¹²

⁸ Personal correspondence with Gregory D. Connors, Maine Municipal Bond Bank.

⁹ If the MFABC issued callable debt, investors would require, at a minimum an equal, but more commonly, a higher rate of return. This difference between callable and non-callable debt is referred to as the “option-adjusted spread.”

¹⁰ For an example of how a MFABC loan is amortized, please see Appendix 1.

¹¹ The author did not contact the MFABC regarding how the swaps were arranged. In Appendix 3, the author describes one method of using plain-vanilla forward swaps to lock in a fixed rate of interest, though it is highly likely that the MFABC transaction is simpler to enter from MFABC's perspective.

¹² An “Extension Swap,” is a special type of forward swap. It allows the municipality to lock in a fixed rate of interest beyond the original tenor of the swap.

An additional flexibility offered by MBBs is the use of bond insurance. Municipal bond insurance which has been available since 1971¹³ and “is an unconditional contractual guarantee by a company to pay the bondholder any bond principal and or coupon interest due on a stated maturity date, but for whatever reason has not been paid by the bond issuer” (Gilbert & Pike, 1995). Obtaining such insurance usually requires that the municipality have investment grade bonds. Major insurers of bonds include The AMBAC Financial Group, The Municipal Bond Insurance Association (MBIA), Financial Guaranty Insurance Company (FGIC) and Financial Security Assurance Inc. (FSA).¹⁴

Financial Security Assurance Inc., the fourth largest municipal bond insurer, charges premiums based on a number of factors including the “type of obligation, the term and average life, rating quality, capital charge for that type of security, market spreads at the time, size of the transaction, FSA’s available credit capacity, etc. Premiums are charged as a percent of total debt service on the bonds and the premium is payable in full, at the time the policy is issued. Premiums range from approximately 10 basis points for Aa/AA rated bonds to 200 basis points for highly structured Baa/BBB bonds.”¹⁵

In theory, MBBs should choose to insure debt if the discounted savings from the reduced cost of debt is greater than the cost of the insurance. Such savings is highly dependent upon the credit rating spread between the MBB and the municipality at the time the debt is issued.

4. Who benefits the most from participation?

¹³ The first use of municipal bond insurance was in 1971. The Greater Juneau (Alaska) Borough Medical Arts Building, General Obligation Bonds were insured for a par value of \$650,000.

¹⁴ In 1986, FSA was the first bond insurer to guarantee an international security.

¹⁵ Personal e-mail with Suzanne M Finnegan, FSA

Because of the heterogeneous nature of various municipalities, MBBs offer different benefits to their participants and some municipalities benefit more than do others from bond bank participation. The relative credit rating spread between the state and the stand-alone municipality, plays an important role in whether an MBB can help a municipality reduce its borrowing cost. Studies indicate that smaller communities with poorer credit ratings benefit the most when issuing debt through MBBs (Cole & Millar, 1982; Katzman, 1980; Kidwell & Rogowski, 1983).

Some large communities, seeing little or no benefit from joining an MBB choose to issue their own debt. A municipality might choose not to use the services of an MBB when they have concerns about implicitly reducing their own debt capacity, improving liquidity and name recognition for debt issued in their own name, as well as a desire to develop their own credit history. This may be a problem for an Asian Bond Bank. Better rated countries such as Singapore, Hong Kong SAR and Taipei, China may not see the benefit of their joining such an organization, seeing little benefit for themselves.

Two methods exist for selling debt to an underwriter, or making an Initial Public Offering, are the negotiated process and the competitive bid process. Empirical studies have found that the competitive bid process typically yields a lower cost of debt than does the negotiated process. However, municipalities with a poor credit rating and municipalities that only need to issue a small amount of debt may have no alternative but to issue debt in a negotiated process. Additionally, because of the composition and complexity of bond bank issues, and the presence of only a “few underwriters who engage in bond bank sales,” most bond banks sell their debt issues to underwriters in a

negotiated process as well. This group includes the Maine and Vermont Municipal Bond Banks [Kidwell & Rogowski (1983)].¹⁶

However, because a large municipality can choose how it will sell its bonds to the underwriter, a direct comparison between municipal issues and bond bank issues may not be appropriate. A municipality with a credit rating equal to the bond bank may have a greater savings if it chooses to issue debt on its own in a competitively bid auction.

Kidwell and Rogowski's study of the Vermont and Maine Municipal Bond Banks showed that the only municipalities that did not benefit from MBB participation were those involved in competitively bid auctions with credit ratings of Aaa and issues over \$5 million, and municipalities with Aa ratings and debt issues over \$40 million. Savings for smaller and more poorly rated municipalities ranged up to 154 basis points.

That is to say, it was only the large, competitively bid bond issues from issuers with Aa ratings or better that did not benefit from bond bank participation.

With such large reductions in the cost of debt, one must ask are there hidden costs associated with MBBs or can one attribute the entire reduction in the cost of debt to improvements in efficiency? Examination of this issue has focused on whether perceived increases in the debt load of the state might increase the overall cost of capital for the region. In the US, MBBs are separate legal entities and in most cases, the senior government is not financially liable for the bank's actions.

However, such a situation may exist if the bond market participants mistakenly assume that the MBB's debt is an implicit obligation of the state. In theory, this could adversely affect the cost of borrowing for the state and indirectly penalize municipalities

¹⁶ In recent years, more than 80% of the dollar volume of municipal IPOs has been sold through negotiated bond sales. Chang, R. (2000). *Overview of US Municipal Bond Market*. Paper presented at the Conference on Development of Indonesian Municipal Bond Market. Jakarta, Indonesia, Nov. 21-22, 2000.

who are not using the MBB. This could occur if investors required an increased premium in compensation for the perceived increase in the state's debt load. Empirical evidence is far from definitive in this matter.

In the US, MBBs are separate legal entities from the state in which they operate. Typically, the full faith and credit of the bank is pledged to the payments of principal, redemption premium and interest, but this is not a "legally enforceable obligation upon the State"¹⁷ though the state often "pledges its moral obligation to the maintenance of a debt service reserve for all of the bond bank's bonds."¹⁸

While municipalities rarely default, problems have arisen. In particular is the case of Leukerbad, Switzerland in 1998. Leukerbad, a small ski and tourist town unwisely borrowed to the point where it could no longer make its interest payments and defaulted. The Swiss government, under no legal obligation to help, stayed away from the situation. Several things make this less likely to happen when a bond bank is involved. First, bond banks examine the ability of the municipality to repay its borrowings. If the bond bank believes the community cannot repay its debt, the bond bank will refuse to issue bonds for that community and the community would need seek alternative methods of raising capital or forgo their intended project. Secondly, the bond bank is a separate entity from the state of government. Should a community fail to repay its debt, and the bond bank also default, the chain of liability stops with the bond bank and the state need not step up and make the interest and principle repayments for the bondholders, thereby limiting the liability of the state.

¹⁷ Maine Municipal Bond Bank, 2000 Series A and B prospectus, page 3.

¹⁸ Alaska Bond Bank 1999 Annual Report, though it pledges its moral support, the state "is not obligated to pay principal or interest thereon. Nor does the State pledge its taxing power to the bonds."

5. Cooperative Borrowing in Europe

Though European countries typically have special banks or agencies that lend to municipalities,¹⁹ cooperative borrowing agencies also exist. Two major cooperative borrowers in Europe are Kommunivest, in Sweden, and Bank Nederlandse Gemeenten (BNG) in the Netherlands.

Kommunivest began its cooperative program in 1986. Currently there are 111 Swedish municipalities and 3 county councils that are members. Like their Canadian counterparts, Kommunivest diversifies its operations to include borrowings from foreign capital markets and in foreign currencies;²⁰ however, such borrowings do not enjoy the tax-free status received by US issues. Kommunivest borrowings are divided among Swedish, other European and Japanese capital markets. The bank does all the documentation, swaps and hedging required for the debt. Moody's current credit rating for Kommunivest is Aa1, the same as that for the Kingdom of Sweden.

Issues of assimilation between better credit rated municipalities and more poorly rated municipalities have arisen in Sweden. The two largest cities in Sweden, Stockholm and Gothenburg, have Aa1 ratings, the same as Kommunivest and both have refused to join the cooperative, believing that economically stronger regions have little, or nothing to gain by joining. Rather these larger, better credit rated communities believe they are “somehow subsidizing the borrowing of weaker municipalities.”²¹ The issue of wanting to establish their own credit history and the desire to develop liquidity and name

¹⁹ European Municipal Finance: Special Reports, “Europe’s Agencies Face a Changing World”

²⁰ “Nordic Munis: Need for Diversification” It is believed that the future currency payments are swapped back to home currency to reduce the exchange rate risk.

²¹ Special Reports, European Municipal Finance “Nordic munis: need for diversification”

recognition for their own debt may further deter municipalities from joining the cooperative. The City Treasurer of Stockholm, has stated, “we feel it would be better over the longer term to leave one or two basis points on the table we would do so.”²²

Problems have arisen in Germany as well. Though written into the German constitution, that various “länder,” or regions, shall be mutually supportive, economically stronger regions are fighting to avoid lending their stronger credit ratings to the economically weaker regions, in particular the newer regions in eastern Germany. These examples demonstrate the difficulties in enticing bigger and better rated regions to join in cooperative borrowing arrangements.

6. Potential Applications to Asia

International credit rating agencies have given many Asian government’s relatively low credit ratings. One of the basic ideas of diversification is that whenever the returns of individual securities are not perfectly correlated, the risk of a portfolio of those same securities can be reduced. This same idea can be applied to the “pooling” and reselling of bonds from multiple countries. Because the economies of Asian countries are quite different, the risk of the overall portfolio of bonds from Asian countries should have a better risk return tradeoff and therefore a lower cost of capital for the bond banks bonds. This savings could be passed on to the borrowing countries.

While Asian sovereign issuers are larger than small US municipalities, small corporate issuers could eventually be allowed to issue bonds through the bond bank. Such involvement with the bond bank’s bonds could significantly increase the secondary market liquidity of the corporation’s debt and reduce their borrowing costs.

²² Peter Antonsson, City Treasurer of Stockholm "Nordic munis: need for diversification."

²³ BNG website pg. 1

Finally, bond banks have another practical advantage. That is the extent to which the borrower is liable for the debt of other borrowers. It seems unlikely that any country would be freely willing guarantee the debt of another. Bond bank bonds are the bond bank's responsibility to repay, not the government of the borrowing country, though it is possible that the country might lose its initial investment in the bond bank.

7. Conclusion

Municipal bond banks first appeared in Canada in 1956 and in the United States in 1970. Since that time, MBBs have been offering a unique and advantageous way for communities to finance municipal projects. MBBs operate as credit enhancing organizations that “pool” multiple municipalities’ borrowing needs into a single issue.

MBBs are efficiency enhancing organizations that are often able to significantly reduce the cost of debt for small, unrated or poorly rated municipalities. The savings of the municipality is highly dependent upon its borrowing needs and the relative credit rating spread between the state and municipality at the time the debt is issued.

Bond banks are heterogeneous in structure, operation and offer varying degrees of flexibility in their amortization schedules and the use of swaps. MBBs are able to improve the borrowing costs for the municipalities primarily through credit rating arbitrage, that is lending funds obtained using their better credit rating to more poorly rated municipalities, though MBBs also lower the cost of debt through the economies of scale in the underwriting process and knowledge of capital markets.

Many Asian countries have poorly rated government debt and this increases their cost of debt. A credit enhancing program modeled along the lines of a bond bank could help Asian countries and firms reduce their cost of capital. Because “pooled” Asian

bonds are essentially a portfolio of bonds, and the price movements of various Asian country bonds are less than perfectly correlated, bond bank bonds could produce a lower risk portfolio and result in a lower cost of capital for the bond bank which could be passed along to the borrowing countries.

References

Alaska Bond Bank Annual Report (2001).

Bank Nederlandse Gemeenten (BNG). Website www.bng.nl/uk/about_BNG/body.htm.

Cole, Charles W., and Millar, James A. (1982). The Impact of Municipal Bond Banking on Municipal Interest Costs, *Financial Management*, Vol. II, No. 1, Spring 1982, p. 70-76.

Conference on Development of Indonesian Municipal Bond Market, Nov. 21-22, 2000. Jakarta, Indonesia, Conference materials.

Fabozzi, Frank J. (2000). *Fixed Income Analysis*, Frank J. Fabozzi Associates; New Hope, Pennsylvania.

Gilbert, Mark, and Pike, Richard. (1995). Credit Enhancement of Municipal Debt, *Canadian Public Administration*, Vol. 38 No. 2. Summer 1995, p. 195-203.

Katzman, Martin T. (1980). Municipal Bond Banking: The diffusion of a public-finance innovation *National Tax Journal*, Vol. 33 No. 2 June, 1980 p. 149-160.

Kidwell, David S., and Rogowski, Robert J. (1983). Bond Banks: A state assistance program that helps reduce new issue borrowing costs, *Public Administration Review* Vol. 43 No. 2 March/April 1983. p. 108-113.

Kolb, Robert W. (1997). *Futures, Options, and Swaps*, Blackwell Publishers; Malden, Massachusetts.

Kommunivest Website: www.english.kommunivest.se/.htm.

Shinn, P. (1988). Bond Banks and Revolving Loan Funds, *Government Finance Review*, June 1988. p. 36-37.

European Municipal Finance: Special Reports
[www.euroweek.com/public reports/592/](http://www.euroweek.com/public%20reports/592/)

1. European munis: not yet an asset class
2. Big names lead the Spanish muni market
3. French munis: promise-and frustration
4. Germany's Länder take their different paths

5. Nordic munis: need for diversification
6. Tiering emerges in the new Europe market
7. Transparency the key in the Euro muni market
8. Europe's agencies face a changing world

Maine Municipal Bond Bank 2000 Series A and B bonds prospectus. (May 2000).

Maine Municipal Bond Bank Financial Application for Municipal Borrowers. (Dec. 2000).

Municipal Finance Authority of British Columbia, Pooled Investments Brochure.

Municipal Finance Authority of British Columbia, Interim Financing, Brochure.

Municipal Finance Authority Act.

Rhee, S.G. (2003) The Structure and Characteristics of East Asian Bond Markets. Working Paper, University of Hawaii.

Vermont Statutes Online: Municipal Bond Bank
www.leg.state.vt.us/statutures/title24/Chap119.htm.

Zorn, Kurt C and Towfighi, Shaw (1986). Not All Bond Banks Are Created Equal, *Public Budgeting and Finance*, Vol. 6. No. 3 p. 57-69.

Appendix 1

Example of payment structure of Municipal Finance Authority of British Columbia for a 20 year \$1,000,000 loan at 5% interest.

20 Year Term

5% Capitalization Rate

Principal: **1,000,000.00** Interest Rate: **5.00%** S/F Factor: 0.030242587

	Principal Payment	Interest Payment	Total Payment	Actuarial	Reducing Balance
					1,000,000.00
Yr 1 Semi Annual		25,000.00	25,000.00		1,000,000.00
Yr 1 Annual	30,242.59	25,000.00	55,242.59		969,757.41
Yr 2 Semi Annual		25,000.00	25,000.00		969,757.41
Yr 2 Annual	30,242.59	25,000.00	55,242.59	1,512.13	938,002.70
Yr 3 Semi Annual		25,000.00	25,000.00		938,002.70
Yr 3 Annual	30,242.59	25,000.00	55,242.59	3,099.87	904,660.24
Yr 4 Semi Annual		25,000.00	25,000.00		904,660.24
Yr 4 Annual	30,242.59	25,000.00	55,242.59	4,766.99	869,650.67
Yr 5 Semi Annual		25,000.00	25,000.00		869,650.67
Yr 5 Annual	30,242.59	25,000.00	55,242.59	6,517.47	832,890.62
Yr 6 Semi Annual		25,000.00	25,000.00		832,890.62
Yr 6 Annual	30,242.59	25,000.00	55,242.59	8,355.47	794,292.56
Yr 7 Semi Annual		25,000.00	25,000.00		794,292.56
Yr 7 Annual	30,242.59	25,000.00	55,242.59	10,285.37	753,764.60
Yr 8 Semi Annual		25,000.00	25,000.00		753,764.60
Yr 8 Annual	30,242.59	25,000.00	55,242.59	12,311.77	711,210.24
Yr 9 Semi Annual		25,000.00	25,000.00		711,210.24
Yr 9 Annual	30,242.59	25,000.00	55,242.59	14,439.49	666,528.17
Yr 10 Semi Annual		25,000.00	25,000.00		666,528.17
Yr 10 Annual	30,242.59	25,000.00	55,242.59	16,673.59	619,611.99
Yr 11 Semi Annual		25,000.00	25,000.00		619,611.99
Yr 11 Annual	30,242.59	25,000.00	55,242.59	19,019.40	570,350.00
Yr 12 Semi Annual		25,000.00	25,000.00		570,350.00
Yr 12 Annual	30,242.59	25,000.00	55,242.59	21,482.50	518,624.91
Yr 13 Semi Annual		25,000.00	25,000.00		518,624.91
Yr 13 Annual	30,242.59	25,000.00	55,242.59	24,068.75	464,313.57
Yr 14 Semi Annual		25,000.00	25,000.00		464,313.57
Yr 14 Annual	30,242.59	25,000.00	55,242.59	26,784.32	407,286.66
Yr 15 Semi Annual		25,000.00	25,000.00		407,286.66
Yr 15 Annual	30,242.59	25,000.00	55,242.59	29,635.67	347,408.41
Yr 16 Semi Annual		25,000.00	25,000.00		347,408.41
Yr 16 Annual	30,242.59	25,000.00	55,242.59	32,629.58	284,536.24
Yr 17 Semi Annual		25,000.00	25,000.00		284,536.24
Yr 17 Annual	30,242.59	25,000.00	55,242.59	35,773.19	218,520.47
Yr 18 Semi Annual		25,000.00	25,000.00		218,520.47
Yr 18 Annual	30,242.59	25,000.00	55,242.59	39,073.98	149,203.90
Yr 19 Semi Annual		25,000.00	25,000.00		149,203.90
Yr 19 Annual	30,242.59	25,000.00	55,242.59	42,539.80	76,421.51
Yr 20 Semi Annual		25,000.00	25,000.00		76,421.51
Yr 20 Annual	30,242.59	25,000.00	55,242.59	46,178.92	(0.00)
TOTALS:	604,851.74	1,000,000.00	1,604,851.74	395,148.26	

²⁴ This simplification makes for an easier understanding of the process, though in reality, the yield curve can be of any shape since the discounted cash flows from either the floating rate of the fixed rate should be equal or the potential for riskless arbitrage exists.