thespaatzassociation

July 4, 2012

Investment Strategy Analysis

Introduction

At the monthly Board Meeting/Teleconference on May 14, 2012, the Board of Directors unanimously passed the following motion:

> "The Treasurer should invest up to $200,000 in a mix of US Treasury and AAA Corporate bonds to generate income; preserve our capital, and minimize risk. The Treasurer, in consultation with our financial advisor (NOTE: currently RBC), should determine the best percentage mix to achieve these goals."

The goal of the investment strategy was to establish a minimum of $5,000 in annual income, so that the Association could award a minimum of two (2) Aerospace Leadership Scholarships every year. Annual fundraising efforts will be used to award additional scholarships.

NOTE: Examples below are for illustrative and may not reflect exact market conditions.

Bond Investment Principles

Bonds are characterized by a number of factors. Every bond has a **coupon rate** or interest rate. This rate of interest is paid on a semi-annual basis (1/2 of the coupon rate) until the **maturity date** of the bond.

- Entry Rules

Partially matured bonds may have a higher coupon interest rate than newly issued bonds.

A premium has to be paid to purchase a partially matured bond with a higher interest rate.

A portion of the higher interest rate must be amortized and saved to recoup the premium.

After amortizing the premium over the remaining maturity, the remaining net interest may be greater than the current coupon interest rate for newly issued bonds.

Longer maturity bonds will have a higher interest rate than shorter maturity bonds.

A minimum maturity exists for which purchasing partially matured bonds improves profitability.

Bond Investment Alternatives

An investor in bonds can either purchase new bonds at the current coupon rate or partially matured bonds at a previous coupon rate.

When investing in brand new bonds, the purchase price of the bond is the face value of the bond. For instance, a new US Treasury Bond with a 30 year maturity date can be purchased at a par or face value of $1000.

Investing in new bonds is not a good plan **AT THIS TIME**. Bond interest rates are very low. Long term US Treasury Bonds are running around 2.75%. Furthermore, new bonds are issued only on certain pre-planned dates. Waiting until new bonds become available is simply foregoing interest that could be earned.

Evaluating Partially Matured Bonds

Partially matured bonds ***may*** have a much higher coupon interest rate, since the bond was issued years ago, when bond interest rates may have been higher.

Unfortunately, the holders of these bonds know that the rate is higher so that a **premium** has to be paid in order to purchase the bond. For instance, a US Treasury bond that has a remaining maturity of 10 years might have a coupon rate of 10% BUT a purchaser might have to pay a premium as much as 50%. Thus, purchasing a bond with a par or face value of $1000 might actually cost $1500.

At first glance, this investment may seem unprofitable. However, …

Consider the example above. A 50% premium spread over 10 years of remaining maturity translates to a cost of 5% per year. Since the coupon rate is 10%, the net interest rate is 5% per year. If the current interest rate on US Bonds is 2%, then the investor is making an additional 3% in profit, better than the current interest rate.

Another issue here is that the final redemption value of the bonds is based on a par value of $1000. At the end of the 10 year period, the investor recoups $1000 after paying $1500 for the bond. This result looks like a net loss.

However, compute the total cash flow to see that this investment actually made a profit and left the investor with the capital intact. A $1000 par bond was purchased for $1500 with a coupon rate of 10% for the remaining 10 years. Thus, the investor receives 10% of $1000 every year for 10 years. The collected interest would be:

$1000 = ($100/year)(10 years)

At the end of 10 years, the investor has collected $1000 in interest and redeems $1000 at maturity, for a total of $2000. On a $1500 investment, the investor still has $1500 and has collected $500 in interest.

Computing the annual interest rate reveals the following:

3.33% per year = ($500 total interest)/(10 years) / $1500 * 100.0

If the current US Bond coupon rate is 2%, then purchasing the partially matured bond gives a far better interest rate.

Implications To Purchasing Partially Mature Bonds

The only caution to the investor is that a portion of the interest payments on the partially matured bond is an early return of the original capital. This portion must be held in savings rather than being spent.

In the example above, the investor must have enough self discipline to hold $50 per year out of the annual interest payment of $100 so that at the end of the 10 year maturity period, the total of the amount in savings plus the redemption of the bond value at par totals the original investment.

A recap of the example helps to visualize the analysis.

Bond Par Value: $1000 Bond Coupon Rate: 10% Remaining Bond Maturity: 10 years

Purchase Price: $1500 Annual Interest: $100 (Capital Recovery: $50, Earnings: $50)

10 Year Performance: Bond Redemption: $1000 Capital Recovery: $500 Earnings: $500

Annual Interest: 3.33% = (Earnings: $500 / Years: 10) / Investment: $1500

Improving Profitability By Selection Of Remaining Maturity

A minimum partial maturity time limit appears to exist that would make investment in partially mature bonds to be profitable.

Consider the following alternatives for A US Treasury Bond With A Par of $1000:

Remaining Maturity(Yrs)	Coupon(%)	Premium($)
10	7.625	590
15	6.375	570
18	6.250	610

A simple approach can be used to determine amortization of the premium for each bond.

Consider the first bond in the table. The premium is $590 and needs to be amortized over a 10 year remaining time to maturity. The amount of annual interest that needs to be saved to recoup the initial capital is (590/10) = $59. Since the bond has a par value of $1000, the required savings of 5.9% of the of the annual interest represents the portion of the interest payment that is necessary to insure recouping the original $1590 investment.

Since the coupon rate of this bond (from the table) is 7.625%, the real earnings to the investor consists of (7.625 – 5.90) or 1.725%.

The initial bond investment table appears below with the net interest rate results appearing as an additional column of the table.

Remaining Maturity(Yrs)	Coupon(%)	Premium($)	Net Interest(%)
10	7.625	590	1.725
15	6.375	570	2.775
18	6.250	610	2.870

Improving profitability of the net interest of each of these alternatives depends on the current coupon/interest rate available for new US Treasury Bonds. If the current coupon rate is 2%, then the first bond is less profitable while the other bonds improve profitability over the current coupon rate..

In this example, a minimum of 14-15 years of remaining maturity is necessary to obtain improved profitability over the current coupon rate.

In a portfolio, an investor might still want to invest in the shorter term bonds, for reasons that will be explained in the portfolio strategies section below.

- A Simple Comparison Of Investment Alternatives

Net rates of return in partially expired bonds may not seem like a lot of return, until compared with an investment in a new bond at current coupon rates.

Option 1: Investment in a new bond

Right now, bond coupon rates are very low. Consider investing in a 10 year bond with a par value of $1000 at coupon rate of 2%. Annual interest is $20. Total interest for the 10 years is $200. The annual interest rate is 2%. When the bonds are redeemed, the investor recoups the original investment of $1000.

Option 2: Investment in a partially expired bond

Consider investing in a bond at a premium of $1500 with ten (10) years until maturity, a par value of $1000 at coupon rate of 10%. Annual interest is $100, with $50 held as capital recovery and $50 as earnings. Total earnings for the 10 years are $500. When the bonds are redeemed the investor recoups the $500 held as capital recovery plus the par value of the bonds, so that total recoup is $1500, the original investment.

Option 1, New Bond: 10 Year Earned Interest -- $200

Option 2, Partially Expired Bond: 10 Year Earned Interest -- $500 (After Holding For Recoup)

Assuming that the investor has $200,000 to spend, 200 bonds could be purchased.

Option 1, New Bond: 10 Year Earned Interest -- $200 * 200 bonds = $40,000

Option 2, Partially Expired Bond: 10 Year Earned Interest -- $500 * 200 bonds = $100,000

In both options, the investor ends with the original capital. However, the difference in income between the two options is astounding.

- Exit Rules

Partially matured bond premiums float based on the coupon rate of new bonds.

If current coupon interest rates increase, partially matured bond premiums decrease.

If current coupon interest rates decrease, partially matured bond premiums increase.

Selling when the current interest rate has increased after purchase usually realizes a loss.

Selling when the current interest rate has decreased after purchase usually realizes a profit.

If interest rates fall below net interest at purchase, premium falls below original premium.

Exit alternatives include sell before maturity, hold to maturity, hold then reinvest.

Given the current low coupon rate, holding then reinvesting is the best approach.

Early maturity bonds should be reinvested to expire at the latest maturity in a portfolio.

Early maturity bonds should be reinvested with at least the same net interest.

Once an investor has purchased partially mature bonds, the investor must determine the length of time to hold the bonds. Now, the investor is in a position to possibly benefit from the premium for selling the partially matured bond.

Assume that a partially matured bond is purchased when the current coupon rate is 2%. If new bond coupon rates jump to 3%, then the partially matured bonds purchased when the rate was 2% are now less profitable.

Analysis Of Premium When Coupon Rate Increases

Recall the table from the example above:

Remaining Maturity(Yrs)	Coupon(%)	Premium($)	Net Interest(%)
10	7.625	590	1.725
15	6.375	570	2.775
18	6.250	610	2.870

At a coupon rate of 2%, the bonds with 15 and 18 years remaining maturity were more profitable than the prevailing coupon rate. However, if the new prevailing coupon rate is 3%, then these bonds are no longer more profitable but are less profitable.

In order to make the net interest more attractive in this situation, the premium MUST decrease. Net interest was determined by amortizing the premium over the remaining maturity. Using the last row of the above table, a minimum premium can be calculated that makes the net interest more profitable than the assumed current coupon rate of 3%.

Assume that the net interest needs to move up to 3.25% in order to be more profitable than the new coupon rate of 3%. Annual amortization percent then needs to be coupon rate – net interest rate (6.25 – 3.25) = 3.0%. This annual percentage was amortized over 18 years, yielding a total premium of 18 years * 3% or 54%. Based on a par value of $1000, the premium would have to be $540. This premium is below the premium paid at the time of purchase of the partially expired bond in row 3 of the table.

Since the investor purchased the bond at a premium of $610, selling under these conditions would realize a loss of $70 PER BOND.

Suppose that the investor had invested $200,000 at the premium of $610 or $1610 per each bond with par value of $1000. This investor would be holding (200,000/1,610) or 124 bonds. At loss of $70 per bond, the total loss to the investor would be (124 bonds * $70) = $8680. By selling before maturity, the owner of this bond would realize a 4.3% loss.

The loss computed in this simple analysis is a minimum loss. In the real market, potential buyers would want some additional benefit to purchasing such a bond as the example bond. Therefore, the premium would likely be greater than the premium used for this example.

Thus, the loss to the seller would likely be even greater than computed in this simple example.

Strategy Analysis At The Current Time

Alternative 1: Sell Before Maturity

This alternative only makes sense if coupon rates on new bonds move further downward than coupon rates on bonds at the time of purchase.

Right now, coupon rates on new bonds are extremely low. The most likely direction of movement is upward. Therefore, as the previous example demonstrated, selling partially mature bonds prior to the maturity date are likely to incur a loss of capital.

Alternative 2: Retain Until Maturity

This alternative makes sense if coupon rates are expected to rise. In this situation, holding the bonds to maturity captures the complete interest payment and benefits for purchasing the partially matured bonds in the first place.

However, the total capital may not be completely recovered, if insufficient savings are retained from the annual interest payments. If an investor needs to spend more of the annual interest than would allow recoup of the capital, then this approach, by itself would leave the investor short some of the original capital investment.

Alternative 3: Retain Until Maturity, Reinvest To Recoup More Lost Capital

This alternative is most effective when an investor possesses a portfolio of bonds with differing maturity dates AND when the investor needs to spend more cash than is necessary to completely recoup the capital.

If an investor possesses a portfolio with bonds that mature a different maturity dates, then the earlier maturity bonds should be reinvested. Reinvestment maturities should be chosen so that all the bonds mature at the same date as the bond that has the longest maturity date. Matching all of the bond maturities in this fashion will insure that the original capital will be collected, assuming that the reinvestment net interest is at least the same value as the original net interest.

Consider a portfolio containing one bond that expiring at 14 years with a net interest of 3% and another bond expiring at 30 years with a net interest of 4%. When the first bond expires at 14 years, the bond should be reinvested for another 16 years (30-16) with a net interest of 3% or greater. In this manner, if insufficient annual interest payments have been

saved to recoup the original capital investment, reinvesting in this manner will insure that at least the original capital will be available at the maturity of the 30 year bond.

- Portfolio Structuring

A bond portfolio consists of a collection of bonds that yield a combined annual net interest.

Laddering should be used to balance higher net interest with shorter term liquidity.

High grade corporate bonds should be included to obtain higher net interest with limited risk.

Balancing the portfolio across laddering, high grade corporate bonds is accomplished by maximizing net interest rate of the portfolio with bonds maturing after the minimum maturity.

Percentage of corporate bonds should be limited to an acceptable risk level for the investor.

High grade corporate bonds are bonds rated AAA by a rating agency such as Moody's.

Investing in bonds involves contradictions and competing objectives.

Bonds with longer maturity dates tend to provide higher interest. This result occurs because the issuer of the bonds has a longer period in which to repay the par value of the bonds. A long term commitment of the funds by the purchaser of the bonds limits the ability of the purchaser to invest in higher interest rate instruments that may be available further down the road. Thus, the issuer of the bonds has to provide an incentive to induce the purchaser to commit to a longer maturity date. This inducement takes the form of a higher interest rate.

Bonds with shorter maturity dates tend to provide lower interest. The bond purchaser commits the funds for a shorter period of time, resulting in more liquidity and greater opportunity to invest in higher interest rate instruments that may be available further down the road.

For a bond investor, the solution to these contradictory investments objectives is to ladder the investments. Laddering consists of purchasing some bonds with shorter maturities and some bonds with longer maturities. Shorter maturity bonds provide earlier liquidity at a reduced interest rate. Longer maturity bonds provide higher interest rates and with less liquidity.

Balancing the portfolio across laddering and corporate bonds is accomplished by maximizing net interest rate of the portfolio with bonds that mature after the minimum maturity. An investor will have to evaluate a number of possible portfolio combinations that insure that the net interest rate of each bond in the portfolio as well as the net interest rate of the portfolio is maximized and that all of the maturities provide a better net interest rate than the current coupon rate of new US Treasury bonds.

Net interest rate for the portfolio can usually be increased by investing in corporate bonds. Longer term corporate bonds have greater risk – the company may not be viable at the expiration of the bonds, so that the investor will have lost the total par value of the bonds. As a result of this higher risk, corporations usually have to offer an additional incentive in the form of higher interest or coupon rates. An assumption is that the Federal government will always be around and able to redeem its bonds at par value.

Multiple combinations of US Treasury and corporate bonds will need to be evaluated by the investor to balance the level of risk, the net interest rate of the portfolio, and the minimum maturity date for best profitability. An exact mix of US Treasury and corporate bonds will also depend upon the risk tolerance of the investor. Generally, bond investors are risk averse. A mix of 10% to 14% laddered high grade corporate bonds with the balance in laddered US Treasury bonds is usually the reasonable risk limit for investors who want to invest in US Treasury bonds because of risk aversion.

- Performance Evaluation

Yield is generally calculated using net present value of interest payments over maturity.

Net present value utilizes a discount factor, which is generally not documented or explained.

If interest payments are used to fund operations, net present value underestimates the yield.

If interest payments are used to fund operations, absolute cash flow is more relevant.

If operations activities funded by interest payments are not subject to inflation, absolute cash flow is more appropriate and more important for determining yield.

Everyone involved in the bond investment arena uses a common measure of bond performance: yield. Yield is almost always determined by computed net present value of the cash flow of the annual interest payments, paid on a semi-annual basis.

The coupon rate of the bond is used to project semi-annual interest payments. These payments are then discounted back to the present year, using a discount rate. All of the discounted payments are then summed, divided by the years to maturity, and then divided by the cost of the bond, including the premium.

Net present value might be appropriate for many large investors. However, for an investor who plans to use some of the cash for immediate ongoing operations, this approach has a number of shortcomings. Calculations are based on a discount factor. The discount factor that was employed is generally not revealed. This factor is supposed to represent the opportunity cost of alternate investments OR an inflation rate. If the source of and justification for the discount factor is not revealed and discussed, an investor should NOT use the net present value calculation for yield.

Worse yet, if the investor is using some of the interest proceeds to support ongoing operations, the net present value formulation is likely to significantly underestimate the actual yield of the cash flow.

For this organization, a portion of the annual interest is being used to fund annual scholarships. A fixed funding level has been determined to be the objective. Expenditures over the last ten (10) years have shown that the costs of a scholarship are not significantly subject to inflation. The primary cost of a pilot's license as funded by the scholarship is the flight instructor's fees. These fees have remained relatively constant, and in many cases $0/hour. The instructor time is often donated by flight instructors from another organization who provide candidates for the awarded scholarships.

For these reasons, yield is computed for the portfolio combinations based on actual interest payments and not on the net present value formulas as normally used. Yield calculations performed in the earlier examples of this document utilized the actual interest payments and did NOT use the discounted interest payments.

The Actual Investment Portfolio

Invest in partially matured bonds to obtain a higher yield.

Compute yield based on absolute cash flows of interest payments.

Select bonds with high yield & minimum maturity date so sufficient time to amortize premium.

Use a laddered approach to select a mix of US Treasury Bonds with differing maturity rates.

Use a reasonable mix of US Treasury Bonds and high grade corporate bonds to improve rates with a minimum of risk.

Select mix of bonds that allows $5,000 cash for operations & still recaptures most of capital.

Since the primary goal is to allow $5,000 cash for operations to sponsor multiple annual scholarships, the objective switches from maximizing net interest rate to obtaining enough funds over the $5000 contribution to recapture most of the original investment.

A number of portfolios were evaluated using the guidelines defined above. The final portfolio selected was as follows:

Source	Init Investment	Number Bonds	Par Value	Coupon Rate(%)	Premium	Number Years	Yield(%)
US Treasuries-14	24017	15	15000	6.5	60.11	14	4.06
US Treasuries -19	30635	20	20000	5.375	53.18	19	3.51
US Treasuries -30	121476	110	110000	3	10.43	30	2.72
Johnson & Johnson	11602	8	8000	5.95	45.03	25	4.10
Microsoft	13117	10	10000	5.2	31.17	27	3.96
Total	200847	Redemption	163000		Total Interest Collected		9015.00
					After $5000/Year Spent		
Corporate	12.3	Net At 30 Years				172015	

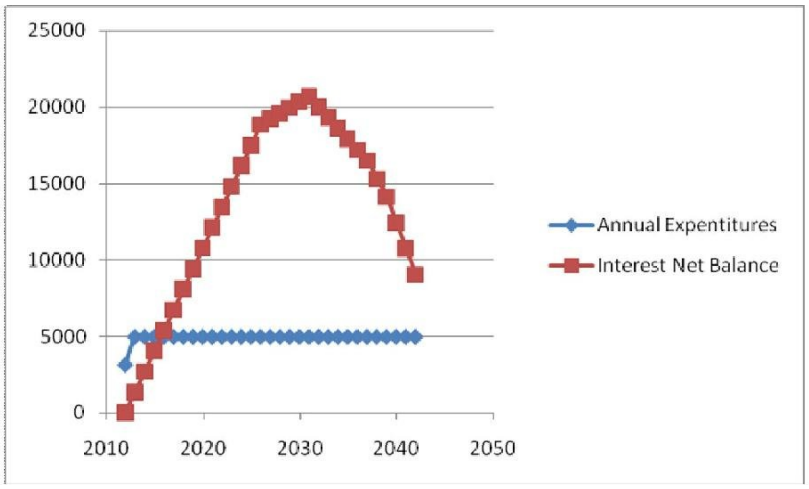
This table contains the actual investment profile. Minimum maturity period that maximized yield is 14 years. Yield is based on actual interest cash flows and is computed relative to the initial investment, NOT the Par Value. Net at 30 years is the total of par values at redemption ($163,000) and the annual interest payments over and above $5000 spent to support scholarships ($9015). Thus, principal recovered at the end of 30 years – assuming no reinvestment – is $172,015.Around 12% of the profile is invested in corporate bonds, well within the suggested guidelines.

US Treasuries – 30 are recently issued bonds with a remaining maturity period of 30 years. **All of the other bonds with shorter maturities have yields greater than the US Treasuries – 30 yield of 2.72%, which is the best current rate that is available at this time.**

After spending $5000 per year on scholarships out of the interest payments, a large percentage of the capital is recovered at the end of the 30 year time frame. In fact, 85.6% ($172,015/$200,847) of the initial capital is recovered without reinvestment of bonds that expire. However, a full capital recovery is possible with reinvestment of expiring bonds (see the reinvestment analysis below).

Investment Portfolio Cash Flow

A complete cash flow projection was performed that reflects the annual interest payments and the scholarship payments over the lifetime of the portfolio.



Annual expenditures consist of the $5000 utilized each year to fund scholarships. Interest net balance is the accumulated interest that is held in savings OVER AND ABOVE THE FUNDING DOLLARS to help recoup the loss in capital that occurred due to the payment of premiums at purchase. At the end of the 30 year profile, the balance of $9015 is added to the redemption values of the bonds at par value to reflect the total capital contribution that has been recovered.

The actual spreadsheet of cash flows appears in the Appendix to this report.

Guidelines For Future Boards

Hold all bonds to maturity to avoid principal loss

Do not spend excess over $5,000 to minimize principal loss

Reinvest bonds that mature at the same rate or better to avoid principal loss, if possible

Monitor bond and other financial markets carefully for changing instruments/interest rates

Monitor tax rules for 501c3 corporations to insure that tax exempt status is not lost

- Hold to maturity to avoid principal loss

  Bond rates right now are some of the lowest in a long, long time. Since the rates are low, the likelihood is that bond rates will only increase. As described earlier, if bond rates increase, the selling premium on the bonds in the portfolio will also decrease. Selling bonds in the portfolio at a lower premium results in a loss of capital. Holding all of the bonds to maturity guarantees that a further erosion of principle will not occur.

- Do not spend excess over $5,000 to minimize principal loss

  The profile was established to provide the $5,000 annual contribution towards scholarships.

Keeping the remainder of the annual interest payments in savings contributes to the recapture of the original principle investment.

- Reinvest bonds that maturity at the same rate or better to avoid principal loss if possible

Many of the bonds in the portfolio expire before the US Treasury – 30 bonds. These bonds need to be reinvested at or close to the rate of the time of maturity. **Interest from the reinvested bonds will be completely contributed towards capital recovery, since the interest from the initial bond investments will carry the annual $5000 expenditure.**

A spreadsheet was constructed to show the benefits of additional interest from reinvestment after bond maturity, as follows:

Source	Initial Investment	Number Bonds	Redemption Value	Premium	Coupon Rate(%)	Yrs To Reinvest	Yield(%)
US Treasuries-14	24017	15	15000	60.11	6.5	16	4.06
US Treasuries -19	30635	20	20000	53.18	5.375	11	3.51
US Treasuries -30	0	0	110000	0.00	0	0	0.00
Johnson & Johnson	11602	8	8000	45.03	5.95	5	4.10
Microsoft	13117	10	10000	31.17	5.2	3	3.96
Total	79371	Redemption	163000	Original Reca	9015.00	ReInvest Interes	31365.00
Corporate	12.3	Net At 30 Years				203380.00	

This table shows the effect of reinvesting the bonds that mature earlier than the US Treasuries – 30. Each bond is reinvested for enough years to mature at the same time that the US Treasuries – 30 mature.

In this table, each of the bonds that mature earlier are reinvested AT THE SAME PREMIUM AND AT THE SAME COUPON RATE. Actual market conditions at the time of reinvestment may differ.

All of the interest from the reinvestment contributes to the capital recovery, because interest from the earlier bonds serves to provide funding for the annual scholarship awards.

At the end of the 30 year period, the bonds all mature at par value. In the table, the par value of all the bonds is $163,000. Added to this par value is the $9015 in savings from the excess interest saved from the original profile. Finally, the additional interest from the re-investment of the early maturing bonds totals $31,365. Adding these components together provides the total cash on hand of $203,380.

Careful reinvestment of bonds that mature early provides a complete recovery of the

original investment amount, even after 30 years of scholarship funds at $5000 per year.

Even if reinvestment at the same interest rates is not possible, reinvestment of the earlier bonds for periods to expire at the same time as the longest bond expiration is better than not reinvesting at all. Net interest (coupon rate less the annual interest to recapture the reinvestment premium) gathered from the reinvestment will help to recover any unrecovered premium from the initial investment.

- Monitor bond and other financial markets carefully for changing instruments/interest rates

  If history of the financial markets is any teacher, new financial instruments are being introduced all of the time. For a long period, investment in equities was the preferred approach. With the recent volatility in the market, bonds seem to be the best investment approach. In the future, new types of bonds and/or different economic conditions may lead to different investment strategies. Monitoring of the financial markets and investment alternatives should be an ongoing process. As bonds in the portfolio mature, simple reinvestment may not be the best financial course.

- Monitor tax rules for 501c3 corporations to insure that the corporation does not lose its tax exempt status.

  Under current 501c3 tax rules, a maximum of 33% of the gross income of the 501c3 corporation OVER A 5 YEAR PERIOD can be earned from passive investments. That limit means that the corporation needs to insure that at least 67% of the gross income should come from other sources, such as donations and the Annual Winter Dinner. Failure to meet this minimum can cause the corporation to lose its 501c3 status.

  Just to be safe, the 67% minimum should be utilized as an ANNUAL objective.

  A review of the interest payment profile in the Attachment shows that the annual interest payment from the portfolio is a maximum of $6346. During those years, the income from other sources should be at least $6346/0.67 or $9471. Note that this amount is gross income.

  In the last few years, the fund raising efforts – donations and the Annual Winter Dinner – have raised at least twice this amount, so for now, the limitation is not a problem for the corporation.

  However, the government can and has changed this limit many times over the years. Given the government's current overspending and the need for additional income, the 501c3 limit is likely to be a target. Raising the minimum will cause many 501c3's to lose tax exempt status. These corporations will then have to pay income tax, which benefits the

government but obviously does NOT help our program.

Future Boards should pay careful attention to the tax limitations and work to insure that annual fundraising provides the minimum gross income to maintain 501c3 tax exempt status.

Bruce E. Krell, PhD.

Spaatz #44

National Treasurer

The Spaatz Association, Inc.

Attachment

Portfolio Cash Flow Analysis

Year	US Treasuries -14	US Treasuries -19	US Treasuries -3	ohnson & Johnson	Microsoft	Annual Total	Annual Expenditure	Balance
	14	19	30	25	27			
2012	487.5	537.5	1650	238	260	3173	3173	0
2013	975	1075	3300	476	520	6346	5000	1346
2014	975	1075	3300	476	520	6346	5000	2692
2015	975	1075	3300	476	520	6346	5000	4038
2016	975	1075	3300	476	520	6346	5000	5384
2017	975	1075	3300	476	520	6346	5000	6730
2018	975	1075	3300	476	520	6346	5000	8076
2019	975	1075	3300	476	520	6346	5000	9422
2020	975	1075	3300	476	520	6346	5000	10768
2021	975	1075	3300	476	520	6346	5000	12114
2022	975	1075	3300	476	520	6346	5000	13460
2023	975	1075	3300	476	520	6346	5000	14806
2024	975	1075	3300	476	520	6346	5000	16152
2025	975	1075	3300	476	520	6346	5000	17498
2026	975	1075	3300	476	520	6346	5000	18844
2027		1075	3300	476	520	5371	5000	19215
2028		1075	3300	476	520	5371	5000	19586
2029		1075	3300	476	520	5371	5000	19957
2030		1075	3300	476	520	5371	5000	20328
2031		1075	3300	476	520	5371	5000	20699
2032			3300	476	520	4296	5000	19995
2033			3300	476	520	4296	5000	19291
2034			3300	476	520	4296	5000	18587
2035			3300	476	520	4296	5000	17883
2036			3300	476	520	4296	5000	17179
2037			3300	476	520	4296	5000	16475
2038			3300		520	3820	5000	15295
2039			3300		520	3820	5000	14115
2040			3300			3300	5000	12415
2041			3300			3300	5000	10715
2042			3300			3300	5000	9015

The net value at the end of the 30 year period is $9015. This amount is applied to the par values of the bonds that expire and thus represents a partial recapture of the premiums for the original investments. This net does NOT include the part values of the bonds that are redeemed at the end of their maturity period.