The High Costs of Capital Appreciation Bonds and Intertwined Bond Usage: Evidence from Puerto Rico

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ABSTRACT:

Capital Appreciation Bonds are similar to zero coupon bonds and not the more typical current interest bond. They are issued for periods well in excess of the normal 25 year municipal bond. In addition, a normal payback for a municipal bond is 2 to 3 times the amount borrowed at the municipal bond's issue while it is as much as 1,800 times for Capital Appreciation Bonds. This paper explores Puerto Rico's debt issues and the compounding and perpetuity effect on those debt issues by the use of Capital Appreciation Bonds. The serious problems of Puerto Rico's debt structure, past and probable defaults, and underfunded pensions are explored through the intertwining of their debt issues between agencies. This misjudgment and poor fiscal oversight by Puerto Rico effectively insures another more serious crisis, even if they weather their current situation, the next debt crisis will have far reaching consequences on their pensions and economic future.

KEYWORDS: Capital Appreciation Bond, Puerto Rico, Pensions, Sales Tax Bonds

1. Introduction:

Puerto Rico has a population less than that of Oklahoma (3,704,329) and a gross domestic product smaller than Mississippi ($103.1 Billion vs. $104.1 Billion in 2013). According to usgovernmentspending.com it also has more debt $70 billion than any U.S. state government with the exceptions of California and New York. In addition, Puerto Rico is carrying a debt to GDP ratio greater than any three states combined. We explore the effect of a type of bond, called a Capital Appreciation Bond (CAB) developed by Goldman Sachs, and its use in Puerto Rico on an already serious debt crisis. CABs are a type of municipal bond but the similarity ends there. The CAB postpones payment of any interest until the redemption of the bond, compounding and accruing those payments with the principal at the time of redemption of the bond. In the case of Puerto Rico, the maturity is 55 years. Municipal bonds normally pay interest on a semiannual basis at the same rate over their life and are issued with maturities from 10 to 30 years with the entire bond issue redeemed at face value on the maturity date. A municipal bond is a debt security issued by a public agency, such as state, city or school district, to finance (new money) or refinance (refunding) capital expenditures. Typically, the federal, state and local governments allow the interest income on municipal bonds to be exempt from income taxes in the state of issue only. In the case of Puerto Rico, its municipal bonds are exempt from federal, state, and local taxes throughout the US, making these appealing bonds, especially in New York City where there is a sizable city income tax.

Puerto Rico issued CAB sales tax bonds (COFINA bonds) in 2007 through 2011.These bonds are backed solely by sales tax revenue and have a minimal probability of redemption. The Puerto Rico Pension fund, less than 1% funded, purchased $163 million of these bonds, stating in their financial report that they have increased in value to $230 million, per the Commonwealth of Puerto Rico's Government Development Bank. In fact, they are only worth $16,731.00 as shown on bondview.com, an online bond quote service, clearly reflecting their high probability of default. Thus the pension fund, which has also issued bonds in its own right, faces bankruptcy. This will be compounded by the default of these COFINA bonds which were purchased to shore up the pension fund. This paper will explore the details of Puerto Rico's debt issues, focusing on these two bond issues and the compounding impact to Puerto Rico and its state pension fund.

2. Background on Capital Appreciation Bonds (CABs):

Capital Appreciation Bonds (CABs) are municipal securities that defy typical municipal fiscal standards and controls (Estes, Fudge, & Van Wart, 2014). A CAB is a municipal security in which the investment return on an initial principal amount is reinvested at a stated rate until maturity, at which time the investor receives a single payment representing the face value of the bond and all accrued interest (Fudge, 2013). The initial investment is a deeply discounted value from the bond's face value and the bonds are frequently sold in multiples of $5,000. CABs are different from zero coupon bonds because the investment return is considered to be in the form of compounded interest rather than accreted original issue discount. CABs often are not callable and if they have a sinking fund (most do not have a mandatory payment provision in the bond indenture agreement), payments to that fund are often not started until after 15 or 20 years into the bond's life, leaving no debt service to be reported on financial statements (Ayala, 2013).

Because of the deep discount at purchase, CABs are a very expensive financing mechanism for the issuer. They are carried on the buyer's balance sheet at only the accreted value or the original cost, the accreted value representing the gradual increase of the bond until maturity. However, they are only shown in a footnote on the balance sheet of the issuer; it is not required that they be shown as a liability or expense since there are no current interest payments. This can serve to hide the future liability that they represent for the issuer while ignoring the risk for the buyer through the use of accreted values that do not reflect any risk factor (indicated by the credit rating of the bond) but a simple calculation of the increasing value.

Despite the risks and costs of CABs, these securities are often enticing to cash-strapped municipalities with a lack of financing options. In addition to providing financing, these bonds are carried on the issuer's books at only their principal values, the heavily discounted amounts at which they are issued. This amount reflects the significant risk of a long term bond without any interest payments or sinking fund provisions (Estes, 2013; Estes & Sheil, 2015). Despite the discounted amounts shown on balance statements, at maturity municipalities face fiscal disaster when they are on the hook for accreted values that can be 10 to more than 100 times what was received at issue (Adelmann, 2013; Lusvardi, 2012).

Accretion is the gradual increase of an asset over time while amortization is the gradual decrease of an asset over time. Although they are often used interchangeably, they are quite different in both premiums and discounts. The Municipal Securities Rulemaking Bureau (MSRB) defines accretion of discount as an accounting process by which the book value of a security purchased at a discount from par is increased during the security's holding period. The accretion reflects the increase in the security's value as it approaches the redemption or maturity date and face amount of the bond. Compound accreted value is defined by the MSRB as the nominal value, at any given time, of a security such as a capital appreciation bond of which all or a portion of the investment return is received in the form of an accretion from an initial principal amount to maturity or redemption value. The compound accreted value is equal to the initial principal amount plus the accretions (calculated on the compound interest method) to that date. In the case of Puerto Rico's Pension Fund, it specifically states the accreted value of its bonds, misstating the value by 13,746.9 times the actual value. Given the significant accreted values to be paid in the future, the lack of funds being set aside to service the debt, and the growing liability for Puerto Rico, CABs present a particularly dangerous method of funding for Puerto Rico.

3. Puerto Rico's Debt Issue:

Puerto Rico has faced a history of economic challenges. According to the United States Treasury report entitled "Puerto Rico's Fiscal Challenges" (2015), Puerto Rico has experienced a record of poor fiscal performance due to unrealistic budget and revenue estimates, lack of fiscal discipline, and opaque reporting and disclosure. Despite these challenges, historically the Commonwealth has been able to rely on the municipal bond markets for relatively low-cost financing. According to Wirtz, Timiraos, and Kiriloff of the Wall Street Journal (2015), the popularity of these bonds, due to their tax-free nature, led to the amassing of over $71 billion in total bond indebtedness (representing over 70% of GDP and over 100% of GNP), including close to $50 billion in tax-supported debt. This amounts to more than a third of annual tax revenues being consumed by debt service. According to Walsh of the New York Times (2015), this amount of debt is more than twice the debt per capita of the two worst US states combined.

These high levels of debt and historical poor fiscal performance combined with a lack of growth and increasing poverty, unemployment, outmigration, and economic uncertainty have led to the downgrade of the Commonwealth's general obligation bonds and Commonwealth guaranteed bonds to non investment grade and to the loss of access to market funding for Puerto Rico. According to the US Treasury report on Puerto Rico's fiscal challenges, first, over the last two years, Puerto Rico has had to rely on nontraditional lenders who would place their high cost bonds to make fiscal ends meet. However, in the past year, Puerto Rico can no longer even raise expensive short-term financing in the markets. In addition, according to the U.S. Treasury, existing uninsured bonds trade at up to a 70% discount which suggests a high likelihood of restructuring.

Given the lack of available financing to support Puerto Rico's immediate fiscal needs, the Commonwealth has begun to run of cash and to utilize emergency liquidity measures (Krueger, Teja, and Wolfe, 2015). Payments to vendors are stretched, tax refunds are delayed, pension assets have been liquidated early, debt service has been withheld, and ultimately Puerto Rico predicts it will be out of liquidity in the very near future. When that occurs, Puerto Rico will no longer be able to both repay its debts and continue municipal services. In fact, according to the Puerto Rico Fiscal and Economic Growth Plan (2015), without emergency measures, Puerto Rico estimates a negative cash balance throughout fiscal 2016. Puerto Rico identifies this as a risk factor in its quarterly report dated May 7, 2015:

> *"The Commonwealth may need to implement administrative and emergency measures in fiscal 2016 and thereafter, which could include a moratorium on the payment of debt service or debt adjustment... The Commonwealth's liquidity during the balance of fiscal year 2015 and throughout fiscal year 2016 may be significantly impaired. As a result, it may be unable to honor all of its obligations as they come due."*

As explained in the U.S. Treasury report outlining Puerto Rico's fiscal crisis, *"There is no doubt that there is a large gap between Puerto Rico's required operating expenses,* contractual debt obligations and its *available financial resources."*

To confront these fiscal challenges, Puerto Rico has taken a number of actions in recent years including cutting operating expenses and increasing tax rates. According to its recent quarterly financial statements dated May 7, 2015, Puerto Rico has also proposed an alternative solution: it plans to issue bonds based on its new petroleum tax. However, despite the action, restructuring of Puerto Rico's debt appears to be inevitable. According to Puerto Rico's Fiscal and Economic Growth Plan (2015), a $14 billion fiscal gap is expected over the next five years even after policy changes that further increase tax revenue. The U.S. Treasury report on Puerto Rico's Fiscal Crisis predicts that that gap will likely need to be filled through restructuring of Puerto Rico's complex debt burden. Similarly, a private report by former IMF economists Krueger, Teja, & Wolfe (2015) ordered by Puerto Rico's Growth Development Bank suggests that a key solution would be the voluntary exchange of existing bonds for new ones with a later and/or lower debt service profile. Of course, this would require that bondholders believe that the expected value of their claims would increase by allowing the government to continue functioning. Despite the suggested solution, the complex nature of Puerto Rico's bonds, issued by 18 different debt issuing entities all with different legal protections and financial obligations, creates challenges on a scale never seen before in municipal bonds no U.S. state has ever restructured its general obligation debt before.

In the past, Puerto Rico has looked to its public pension funds to aid with fiscal shortages. In fact, according the US Treasury report on Puerto Rico's fiscal troubles, early sales of fund assets have recently provided a significant means of short term financing pushing Puerto Rico's public pension funds to the lowest funded ratio of any state or territory. The US Treasury estimates that at current drawdown rates, the assets will be depleted before 2020 risking the future of Commonwealth retirees. This pending insolvency of the public pension system is another factor that must be considered in financial forecasts as future pension payouts could consume significant portions of Puerto Rico's general fund.

Under United States law, there is currently no bankruptcy protection for American states or territories and a US bailout has proven to be unfavorable among voters and taxpayers.

However, according to Kaske with Bloomberg (2015, Sept 11), lawmakers and the Supreme Court are now considering establishing new bankruptcy protections for territories to address Puerto Rico's issues and, according to Wirtz, Timiraos, and Kiriloff with the Wall Street Journal (2015), the US Treasury has considered the issuance of a "superbond" to aid in restructuring. Both of these propositions include the development of an independent fiscal oversight board to aid Puerto Rico out of its fiscal troubles. Clearly, a bankruptcy of any kind will have negative impacts on the future borrowing ability and costs for Puerto Rico. In addition, there is concern that giving Puerto Rico access to bankruptcy will encourage other fiscally strapped states to seek bankruptcy protection as well.

In addition to the bankruptcy is the impact on the US Municipal Bond Market where about half of muni funds are exposed to Puerto Rican Bonds according to Jeff Benjamin of Investment News (2015). However, according to the Soreide Law Group Website, much more heavily exposed are UBS and Oppenheimer. As can be seen from Table 1 below, which illustrates the largest exposures to the bonds, present losses equal almost $21 billion with value shrinking from $25.5 billion to 4.5 billion as of June 29th of 2015. While this table represents only the top 20 mutual funds, the actual remaining exposure is over $11 billion according to Tom Anderson of CNBC (2015). Obviously the bankruptcy, in addition to having a significant impact on Puerto Rico's economy, would have large reverberations throughout the US muni bond mutual fund market.

Table 1, Top 20 Mutual Funds holding Puerto Rican Bonds

Fund Name	Market Value of Puerto Rican debt as of June 29, 2015	Percentage of the portfolio invested in Puerto Rican de	Total Investment as of portfolio date	Category
Oppenheimer Rochester Fund Muni A	$1,376,856,503	22.30%	$6,185,980,085	Muni New York Long
Oppenheimer Rochester High Yld Muni A	$715,302,841	13.20%	$5,406,587,424	High Yield Muni
Oppenheimer Rochester LtdTerm NY Muni A	$726,558,930	20.60%	$3,515,612,163	Muni Single State Short
Oppenheimer Rochester Ltd Term Muni A	$608,173,909	19.20%	$3,160,840,263	High Yield Muni
MainStay High Yield Muni Bond A	$215,681,931	12.90%	$1,727,077,784	High Yield Muni
Oppenheimer Rochester CA Muni A	$150,523,359	11.40%	$1,328,984,067	Muni California Long
Oppenheimer Rochester AMT-Free NY Muni A	$190,431,569	16.30%	$1,166,986,059	Muni New York Long
Oppenheimer Rochester PA Muni A	$123,108,661	13.90%	$883,561,556	Muni Pennsylvania
Oppenheimer Rochester Ltd Term CA Muni A	$89,003,199	12.90%	$687,146,588	Muni Single State Short
Oppenheimer Rochester NJ Muni A	$82,876,129	17.30%	$479,016,636	Muni New Jersey
Franklin Double Tax-Free Income A	$110,282,812	47.20%	$233,553,864	High Yield Muni
Wells Fargo Advantage WI Tax-Free Inv	$24,420,696	15.30%	$160,092,126	Muni Single State Interm
Oppenheimer Rochester VA Muni A	$40,736,112	33.80%	$120,667,805	Muni Single State Long
Oppenheimer Rochester NC Muni A	$15,577,530	17.30%	$89,810,812	Muni Single State Long
Oppenheimer Rochester Ohio Muni	$10,310,176	14.60%	$70,479,154	Muni Ohio
Oppenheimer Rochester AZ Munici A	$12,059,832	18.80%	$64,312,517	Muni Single State Long
Oppenheimer Rochester MD Munici A	$23,093,065	36.90%	$62,603,594	Muni Single State Long
Oppenheimer Rochester MA Munici A	$9,850,542	16.10%	$61,339,160	Muni Massachusetts
Oppenheimer Rochester Michigan Muni A	$10,105,790	19.50%	$51,801,240	Muni Single State Long
Alpine High Yield Managed Dur Muni A	$5,835,739	13.80%	$42,105,336	High Yield Muni
Totals	$4,540,789,325		$25,498,558,233	

Source: CNBC Puerto Rico Municipal Bond Database: http://www.cnbc.com/2015/06/30/is-your-bond-fund-invested-in-puerto-rico.html

4. Puerto Rico's Sales Tax Bonds:

A significant portion of Puerto Rico's debt stems from its sales tax bonds, originally issued to "plug budget gaps and repay other lenders" (Kuriloff, 2015). After a sales tax was introduced in 2006, the Puerto Rico Urgent Interest Fund Corporation (also known as the Puerto Rico Sales Tax Financing Corporation), the Corporación del Fondo de Interés Apremiante (COFINA) in Spanish, issued bonds backed by Puerto Rico's future sales tax revenues, called COFINA bonds, in 2007, 2008, 2009 and 2011. The Corporation is a subsidiary of the Government Development Bank and was created by Law No. 291 of 2006. Thus, this corporation is effectively a government subsidiary which makes its bonds General Obligation Bonds backed by the full faith, credit and taxing ability of Puerto Rico. However, the corporation feels that the bonds are only backed by the sales tax revenue of Puerto Rico pointing to a future issue to be tested in the courts.

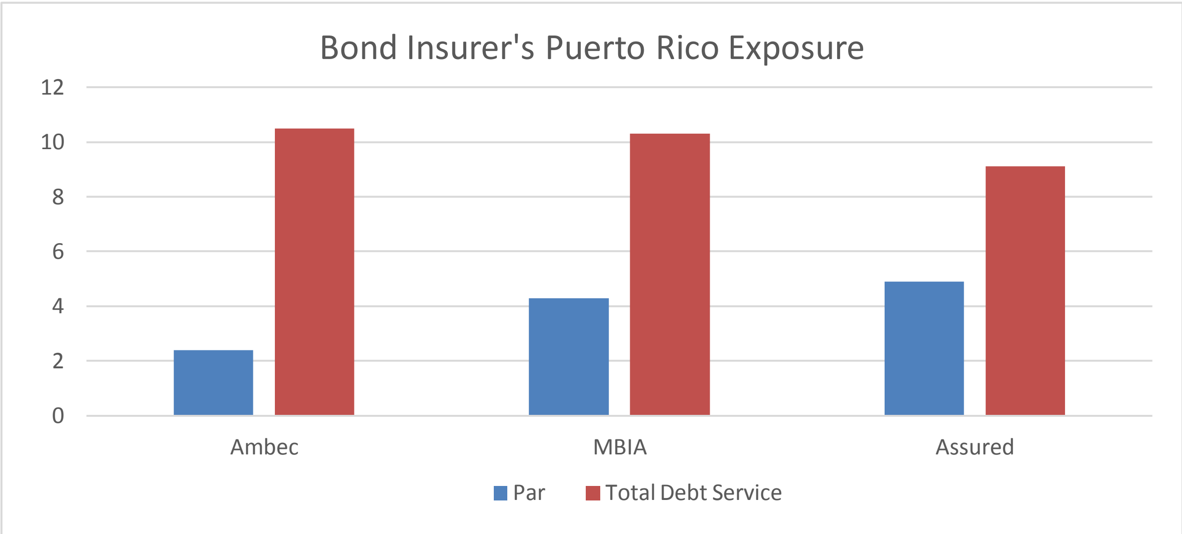
Bonds issued by COFINA are called Puerto Rico Sales Tax Revenue Bonds. Current bonds, according to the Commonwealth of Puerto Rico's Government Development Bank (2015), total over $15.2 billion and are structured to be repaid from dedicated sales tax revenue and come in two types: senior, with the first claim on revenue, and subordinated, which are second in line. The COFINA CABs have a face amount of $3.565 billion with a repayment amount of $4.489 billion. However, Puerto Rico received only $173.5 million at issue, a discount of 96.1% and a payback of 25.9 times the amount borrowed. In a Check on Bond View, an online service that quotes the estimated price of these outstanding bonds, these bonds have a total value of $16,731.00. According to the June 30, 2014 Basic Financial Statement of the Puerto Rico Urgent Interest

Fund Corporation, audited by KPM, a financing deficit of $5,474.5 million has been accumulated. In addition, the bonds have been downgraded twice this year, on 5/11/2015 and 4/24/2015. After these downgrades, the senior bonds currently carry a credit rating of Caa2 and CCC+, from Moody's and S&P respectively, while the subordinated bonds have a credit rating of Ca and CC, respectively.

According to Kaske with Bloomberg Moody's Investors' Service (July 22, 2015), there is a 65-80% likelihood of recovery of the senior debt, the $6.57 billion portion, and only a 35-65% likelihood of recovery of the subordinated debt, the $9.74 billion portion for the COFINA bonds. The required payments for debt maturity are beginning to mount, exponentially increasing Puerto Rico's liquidity issues. Last year, the island collected $1.42 billion of sales-tax revenue in the fiscal year that ended June 30. Nearly 50% or approximately $670 million of that revenue was used to repay COFINAs, according to the US Treasury. In the 2015-2016 fiscal year in Puerto Rico, "after paying $1.2 million of principal and interest in August, $1.2 million of interest is due in November, February and again in May"(Kuriloff, 2015). The increased likelihood of default is reflected in increased yields. Senior COFINAs maturing in 2040 last traded for an average yield of 9.3 percent while subordinate bonds yielded approximately 15 percent. One major issue that is providing a significant stumbling block is that according to Puerto Rico's Constitution, its public institutions cannot declare bankruptcy but are forced to seek a restructuring with the bondholders. As the law requires a consensus to restructure, the subordinated debt holders are in a position to block any restructuring until they are satisfied that they are protected.

Taking steps to bolster its revenue, Puerto Rico has increased its sales tax from 7 to 11.5%, the highest in the US, and will move on April 1, 2016 to a value added tax system. Despite these steps, Puerto Rico's first default occurred on August 3, 2015 when it failed to make a $58 million payment on its Public Finance Corporation (PFC) bonds (Kuriloff, 2015). This broke a 70 year period of successful bond payments by the territory. There is deep concern that this default may signal a series of continuing defaults as their debt problem gets more serious. Compounding the problem, only three of the seven issues of these bonds are insured. These three, according to data from the Thompson Reuters database, were issued with a face amount of $5.675 billion and an amount due of $7.163 billion, but only received a tiny $105.8 million on issue. As can be seen from Figure 1 below, the exposure to the insurance companies is large, though it is thought by those same carriers that their reserves are sufficient in the event of a Puerto Rico default. However, the insured portion represents only 51.6% of the outstanding bonds, 39% of which are the senior bonds; with Puerto Rico left with the balance of liability in the event of a default.

Figure 1, Bond Insurer's Puerto Rico Exposure



Source: Bloomberg: http://www.bloomberg.com/news/articles/2015-09-04/puerto-rico-balloon-payments-seen-as-risk for-some-bond-insurers

As quoted in Bloomberg (Chappatta, 2015), Bill Bonawitz, director of municipal research in Philadelphia at PNC Capital Advisors explains, "The biggest risk for National and Ambac is COFINA. Because of the CABs, they would ultimately owe enormous numbers." The issue at hand is the large accreted values and the lack of funding to date by Puerto Rico. Since there are no current interest payments due there is no immediate risk of default, thus the risk is a long term one and it is substantial. Ambac discloses its exposure to Puerto Rico interest payments on its web site; though it's most recent quarterly filing includes only a tally based on the amount of bonds outstanding. In an interview with Bloomberg (Chappatta, 2015), David Trick, chief financial officer of Ambac, discussed the disclosure, *"You need some sort of consistent basis to disclose your par exposure in your portfolio and that's a metric over time that investors have found valuable in assessing the guarantors and their risk. It's hard to make everything perfectly apples-to-apples without making disclosures extremely complex and potentially confusing."*

5. Puerto Rico's Pension Fund:

According to statistics from the financial statements of the Commonwealth of Puerto Rico, the Government Development Bank of Puerto Rico, and a paper published for the Economic Commission for Latin America and the Caribbean by Ines Bustillo and Helvia Velloso (2015), Puerto Rico's debt issues are compounded when considering the impact on its public pension system. Puerto Rico's Employees Retirement System, covering 119,975 employees, is only 0.7% funded with a shortfall of $44 billion as of December 2015 (Kaske, 2015c). While the pension fund represents government employees who only make up 3.3% of the population, it represents 63% of the 2104 Gross National Product of $69.201 billion and 42% of the 2014 Gross Domestic Product of $103.675 billion. The pension system is poised to run out of money by 2020, which would leave the government on the hook for more than $2 billion in benefit payments the next year alone (Kaske, 2015c). That's equal to about one fourth of this year's general-fund revenue.

In 2008, according to the Thompson Reuters database, the pension fund issued three different tiers of zero coupon Pension obligation bonds (rated at issue BBB-) with a value of $2.947 billion in order to strengthen the pension fund. Today, Moody's rates these bonds Ca, according to bondview.com. The bonds are to be repaid from contributions that the commonwealth and municipalities make to the retirement system with absolutely no guarantee from the Commonwealth of Puerto Rico. At maturity, in 2058, these bonds call for a payment of $3.841 billion. The pension fund received only $71.3 million on the CABs as shown in Table 2 below. The value of these bonds today is $10,853 based on values taken from bondview.com.

Table 2, Value of Bonds Issued by Puerto Rico's Pension Fund

Sale Date	Issuer	Amount of Issue ($ Million)	Amount at Maturity ($ Million)	Amount Received ($ Million)	Value on 24-Dec-15
1/29/2008	Puerto Rico Employee Retirement System	1,588,811	1,700,450	12.948	$ 4,020.00
5/8/2008	Puerto Rico Employee Retirement System	1,058,635	1,833,660	57.808	$ 5,954.20
6/26/2008	Puerto Rico Employee Retirement System	300.203	307.09	0.539	$ 878.90
Totals		2,647,746	3,534,417	71.295	$10,853.10

Data Sources: Thompson-Reuters Database; http://www.bondview.com/price-check/bond

During the fiscal year ended June 30, 2011, the Pension System received a special contribution of approximately $163 million from the Puerto Rico Infrastructure Financing Authority, an instrumentality of the Commonwealth. The entire contribution of $163 million was invested in bonds issued by the Puerto Rico

Sales Tax Financing Corporation (COFINA Bonds), which are intended to provide for a 7% accretion rate and maturity dates between 2043 and 2048. These sales tax bonds are carried on the asset side of the Pension Fund at an accreted value of $270 million per the Thompson Reuters database. As can be seen from Table 3 below, these bonds have a market value of $3,490, representing only .001% of the stated value on the balance sheet, per bondview.com, an online bond quote service.

Table 3, Value of COFINA Bonds Held by Puerto Rico's Pension Fund

Value of the Bonds	CUSIP	Muni Issue Size	Issue Year	Coupon Type	Maturity Date
$ 60.10	29216MBM1	$ 300,203,000	2008	ZERO COUPON	7/1/2030
$ 940.36	29216MAZ3	$ 1,059,000,000	2008	ZERO COUPON	7/1/2034
$ 940.36	29216MAY6	$ 1,059,000,000	2008	ZERO COUPON	7/1/2033
$ 87.00	29216MAX8	$ 1,059,000,000	2008	ZERO COUPON	7/1/2032
$ 943.60	29216MAW0	$ 1,059,000,000	2008	ZERO COUPON	7/1/2031
$ 99.40	29216MAV2	$ 1,059,000,000	2008	ZERO COUPON	7/1/2030
$ 105.90	29216MAU4	$ 1,059,000,000	2008	ZERO COUPON	7/1/2029
$ 112.80	29216MAT7	$ 1,059,000,000	2008	ZERO COUPON	7/1/2028
$ 115.60	29216MAB6	$ 1,589,000,000	2008	ZERO COUPON	7/1/2028
$ 85.00	29216MAA8	$ 1,589,000,000	2008	ZERO COUPON	7/1/2028
$ 3,490.12		$ 10,891,203,000.00			

Data Sources: Thompson-Reuters Data Base; http://www.bondview.com/price-check/bond

According to the US Treasury, as of 2014, Puerto Rico's three public pension funds held just $2 billion in net assets, including the questionable sales tax bonds valued at $240 million, against a combined estimated pension liability of $46 billion. Clearly, Puerto Rico is well below its required contribution to the pension fund. In 2013, as part of the total Employee Retirement System (ERS) legislation pension reform, employer contributions increased from 10% of payroll to over 20% which brings total employee and employer contributions to 30% of payroll. However, even with the legislative reform, the fact remains that with the Commonwealth's current deficit, the pension fund is less than 1% funded. In 2013, Puerto Rico was forced to pay the current pension amounts due by prematurely selling $1 billion of the pension fund assets. At this rate of depletion and with the lack of contributions by Puerto Rico, the funds will be exhausted by the end of this decade. In addition, as part of emergency actions caused by the overall debt crisis the Commonwealth is accelerating the sale of pension fund assets in order to fund government operations. With less than 1% funding, the pension fund is in very serious trouble and with the worsening debt of Puerto Rico, it may be forced to cease pension payments altogether.

6. Discussion:

Puerto Rico's debt crisis has received significant attention in recent years but recognition of the Commonwealth's dependence on high risk CAB municipal bonds has been limited. The COFINA CABs issued in recent years drastically increase the liability of Puerto Rico due to the delay, magnitude of repayment, and the lack of debt service required. According to Aaron Kuriloff of the Wall Street Journal (2015), Puerto Rico may be looking at sales tax revenue as a source of funds for looming interest payments. This would only serve to compound the problems for these failing bonds to which those sales taxes are pledged, reducing the price even further. Holders of these bonds have already told the government that they will sue to block any action to divert sales tax revenue from the bonds. This will make the debt service issue more complicated and difficult to resolve by the due date. To intensify Puerto Rico's problems, the Commonwealth's pension system, funded at a level lower than any U.S. state at less than 1%, issued its own expensive pension CABs and used the proceeds to purchase significant portions of the highrisk COFINA CABs, carrying them on their balance sheet at more than 77,000 times their value, according to the Thompson Reuters Database.With current estimates that the pension fund will be depleted within the decade without appropriate funding, the issue and purchase of these CABs combined with Puerto Rico's immediate lack of liquidity increases the pension fund's risk dramatically virtually insuring depletion of all benefits to present and future pensioners (Bomey, 2015).

Most employees of the Commonwealth of Puerto Rico are covered by the Employees Retirement System of the Government of the Commonwealth of Puerto Rico, which was established in 1951 to provide employees with pension and other benefits upon retirement. The system covers a range of employee groups including general employees, public safety officers, and judges according to the National Association of State Retirement Administrators (NASRA).Should this system collapse and existing employees and retired employees lose their pension benefits, the chaos stemming from this could be disastrous for Puerto Rico. Imagine, if you would, utilities, street maintenance and trash pickup, in combination with law enforcement and the judicial system all ceasing activities for any significant period of time. The effect on the economy and tourism would be a disaster for Puerto Rico. Should Puerto Rico weather their current debt storm, they face another more serious issue related to pension funding and further bond defaults by the end of the decade.

Compounding this is the overall impact of the Puerto Rican Bonds on the bond market, especially municipal bond mutual funds where about half of all funds are exposed to increased risks from holding Puerto Rican Bonds. However, according to the Soreide Law Group Website, UBS and Oppenheimer bear more risk due to their heavy involvement in the Puerto Rican bond market as illustrated in Table 1. A collapse of the Puerto Rico debt market would have far reaching implications to GO bonds, and the funds holding those bonds, throughout the US. Puerto Rico did meet its 2015 obligation to its General Obligation Bonds ($326.7 million) as well as $383 million in debt maturity. However it did so by sacrificing the January 1 bond payment of $37.3 million to the Puerto Rico Infrastructure Financing Authority and the Puerto Rico Public Finance Corporation (Kuriloff, 2016a).This is in addition to having missed the August 3, 2015 bond payment of $58 million payment on its Public Finance Corporation (PFC) bonds (Kuriloff, 2015). Puerto Rico is simply choosing which bonds on which to default in order to meet its constitutional obligation on the GO bonds. While this is a temporary solution, it forces the value of all non GO bonds down to pennies on the dollar and simply postpones the eventual collapse of Puerto Rico's bond debt. Puerto Rico has virtually no options unless the US Congress allows Chapter 9 bankruptcy for some of their municipal entities. This is strongly opposed by retirees and hedge funds and even more doubtful since the Obama Administration has rejected a bailout of more than $70 billion of debt (Kaske & Braun, 2016). Puerto Rico faces the simple alternative of defaulting on their bonds and forcing a complex restructure of their debt after the default. UBS has already been ordered to pay more than $2.9 million to investors for losses tied to Puerto Rico's municipal bonds (Prior, 2015). In addition, according to Soreide Law Group's website, Soreide lawyers have also begun to file FINRA arbitrations related to losses from high risk Puerto Rican municipal bonds. One of these, in Florida, was filed on behalf of an elderly client against UBS. Regardless of the decision made, it is a very dangerous time for either individual investors or bond mutual funds to hold Puerto Rico Bonds, a risk that has yet to be addressed by the regulators of the largest financial entities in the US.

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