U.S. State Tobacco Settlement Revenue Securitizations

Joshua Cain

The Leonard N. Stern School of Business
Glucksman Institute for Research in Securities Markets
Faculty Advisor: Robert Whitelaw
April 3, 2017

I. INTRODUCTION

Tobacco settlement securitizations, also known as tobacco bonds, are a class of securities backed by the ongoing payments from a 1998 civil settlement with U.S. tobacco companies. States began to issue these bonds in 2000, and, as the market for them matured, twenty states and territories (as well as some counties and cities in certain states), executed securitization transactions. Bloomberg quoted the size of this market as $34 billion as of May 2016. (Chappatta, 2016)

Today, many of these bonds are distressed, with bond ratings well into non-investment grade, or "junk", territory. The underlying reason for this is relatively simple: the settlement payments that back the bonds have been significantly lower than forecasted, mostly due to faster declines in cigarette consumption than the forecasts assumed. However, the credit outlook varies widely from bond to bond. In 2015, for example, Moody's announced ratings actions on a number of tobacco bonds, issuing both upgrades and downgrades. (Moody's Global Credit Research, 2015) The ratings issued ranged all the way from Aaa (sf) (Moody's highest category for structured finance) to Caa1 (sf) (seven notches below investment-grade).

Since all tobacco settlement securitizations are backed by the same underlying cash flow, differences in structure, mainly those that affect coverage and seniority/payment priority, are the primary source of this variance in credit quality. Clearly, the relative aggressiveness and complexity of different tobacco bonds has had a real effect on their economics. The municipal investor community recognizes this issue: Nuveen, an asset manager with substantial municipal and tobacco bond holdings, notes that analyzing the credit quality of "each [tobacco] bond requires a detailed, maturity-specific evaluation." (Nuveen Asset Management, 2016)

As a large pool of bonds with homogenous underlying cash flows but differentiated structures and purposes, tobacco securitization bonds are a fascinating anomaly in the municipal bond market. In this paper, I will provide some background on the history and structure of tobacco bonds, and discuss case studies of three tobacco settlement securitizations. I will also examine whether large state issuers, whose debt markets are correspondingly larger and more advanced, realized more favorable pricing on these complex transactions.

While tobacco bonds continue to be issued in more limited quantities, this paper will focus on 2005-2008 vintage securities. As one might expect given buoyant credit markets leading up to the 2008 Global Financial Crisis, this period contained many of the largest and most complex tobacco securitizations. The post-2008 tobacco securitization market was also radically altered by a precipitous decline in per-capita combustible tobacco consumption in 2009, which was a significant contributor to the subsequent credit performance of previously-issued tobacco bonds.

II. PREVIOUS WORK

Though there have been many news articles written about tobacco bonds, the body of academic work that analyzes them is relatively smaller.

Johnson, Kioko, and Abbas in 2013 explored tobacco securitizations' impact on public anti-tobacco spending. To do so, they compared anti-tobacco spending by states that had executed tobacco securitization transactions with that of states that had not. They found a significant negative relationship between the issuance of tobacco bonds and state anti-tobacco spending. (Johnson, Kioko, & Abbas, 2013)

Haile in 2009 further examined the conflict of interest inherent in states' reliance on tobacco Master Settlement Agreement (MSA) payments for general fund revenue. In an analysis of the effects of "sin taxes", he argued that the states' exposure to cigarette sales (through cigarette taxes and MSA payments) incentivized the states to desire higher cigarette sales. He suggested that securitization of these payments could help reduce this conflict, since the state transfers its MSA-payment upside to bondholders. (Haile, 2009)

III. BACKGROUND: THE MASTER SETTLEMENT AGREEMENT

The MSA was the outcome of a landmark civil litigation between many U.S. states and the four largest U.S. tobacco companies at the time[1]. Beginning with Mississippi in 1994, several U.S. states sued the tobacco companies based on the theory that smoking-related ailments had caused, and would continue to cause, the states to bear higher Medicaid and general health expenses. (Janofsky, 1994) While the tobacco companies had prevailed in over eight hundred private lawsuits, the state litigations gained traction by linking the tobacco companies' allegedly deceptive and fraudulent practices to these widespread public health issues. Other states filed similar lawsuits, and soon the major tobacco companies faced a deluge of litigation and enormous potential liability.

After an initial, failed, attempt to arrive at a global settlement through Congressional action, the tobacco companies and forty-six[2] states entered into the MSA in November 1998. The MSA imposed restrictions on tobacco advertising and marketing, disbanded some tobacco industry initiatives, and created the American Legacy Foundation, an organization that works to

[1] Philip Morris, Inc., R. J. Reynolds, Brown & Williamson, and Lorillard

[2] Four states - Mississippi, Minnesota, Florida, and Texas - settled their claims prior to the MSA. In addition to state participation, the District of Columbia and several U.S. territories were also party to the MSA.

encourage smoking cessation and prevention. Critically, the MSA also included a significant financial settlement, requiring the tobacco companies to make billions of dollars in annual payments, commonly known as Tobacco Settlement Revenues (TSRs), to participating states in perpetuity. The MSA payments incorporate an adjustment for cigarette sales levels, such that the level of TSRs will be lower if fewer cigarettes are sold. With estimated payments of over $200 billion in the first twenty-five years, the MSA is the largest civil settlement in U.S. history.

IV. TSR SECURITIZATION STRUCTURES

Naturally, states (and/or their investment bankers) soon realized that they could sell the rights to this ongoing stream of payments in exchange for an up-front lump sum. The basic concept of this type of transaction was not, in fact, novel to municipal finance. Revenue bonds, which are very common in the municipal market, are paid from and secured by a specific type of revenue (such as hotel taxes or tolls) rather than the issuer's general taxing authority. In the event that the revenue stream is not sufficient to meet the bonds' debt service obligations, the issuer is not required to supplement the stream with its own funds. Thus, the risk of lower-than-anticipated revenue is transferred from the issuer to bondholders. In a structure similar to the special-purpose vehicles (SPVs) used in commercial asset securitization, the issuer will often establish a distinct and separate legal entity to receive revenue and pay debt service.

Like any asset securitization, a crucial step in establishing the transaction structure and size is to develop a projection of the size of the future revenue stream that will be used to pay bond debt service. A revenue bond based on hotel tax payments, for example, may use projections of tourist traffic and convention attendance to estimate a future revenue streams. For tobacco bonds, this took the form of a projection prepared by the firm Global Insight (now IHS

Markit). The Global Insight report projected cigarette consumption at a "Base Case" level, as well as stressed levels (one with higher than expected sales, and three with lower than expected sales). This report was used in the structuring of most tobacco securitizations, and was therefore incorporated into their offering documents. (Golden State Tobacco Securitization Corporation, 2007)

In addition to their unique underlying payment source, tobacco securitization transactions also contain a specific payment feature that distinguishes them from most municipal revenue bonds. Rather than having fixed schedules of debt service payments, tobacco bonds include "turbo" redemption features, which accelerate principal payments if excess TSRs are available after paying all scheduled debt service on any given date. This has the effect of giving the bonds a variable maturity date; if revenues are higher than anticipated in the bonds' structuring assumptions, then their maturity date will be earlier than forecasted. Conversely, if revenues are lower than anticipated, the bonds' maturity will be extended. Naturally, the inclusion of this feature makes tobacco bonds' payment streams sensitive to fluctuations in available TSRs, and therefore makes forecasting those payment streams significantly more difficult[3]. Fitch Ratings has, in fact, suspended rating all tobacco bonds due to the difficulty in reasonably forecasting the TSR cash flows. (Chappatta, 2016)

In addition to their turbo redemption features, many (though not all) tobacco bond issues feature tranching mechanisms similar to those found in mortgage and other asset-backed securities (ABS). Tranching creates a structure wherein lower than forecasted TSRs will result in

[3] The timing and size of turbo redemptions are especially important given that interest continues to compound on any anticipated turbo redemptions that are not made. A "missed" turbo redemption will result in fewer excess TSRs being available on all subsequent payment dates as the effect of higher than anticipated interest payments continues to cause lower than anticipated turbo redemptions on those subsequent dates.

reduced payments to lower tranches before scheduled payments to higher tranches are impacted (as opposed to allocating any deficiencies on a pro-rata basis). Thus, different tobacco bond securities within the same bond issue can have wildly different risk profiles, in the same way that the credit quality of any one ABS tranche is affected by its position in the overall securitization. This is, of course, an intentional outcome; investors in lower tranches receive higher yields in exchange for bearing more risk.

Many tobacco bond issues also feature Capital Appreciation Bonds (CABs). CABs are zero-coupon bonds which do not require scheduled interest or principal payments prior to maturity, but instead accrue interest that is then added to the bonds' principal balance. These bonds are subject to turbo redemptions, and, in theory, would be paid much earlier than their stated maturity date. However, as mentioned previously, turbo redemptions are sensitive to fluctuations in TSRs. CABs' payment streams are especially sensitive to these declines, since the lack of turbo redemptions results in higher-than-expected principal balances. This, in turn, causes more interest accrual that increases the bonds' accreted principal value even further, creating a vicious cycle where interest continues to compound at higher-than-expected rates. Tranching exacerbates this effect, since the CABs are low in the payment priority structure and are therefore even more vulnerable to reduced revenues.

In choosing these complex structures, states appear to have followed similar reasoning as private market ABS structurers, namely that more distinct tranches would allow them to reach wider classes of investors. This logic was explicit in bankers' pitches to states seeking to undertake tobacco securitizations. (Goldman Sachs, 2007) As a result, most tobacco securitizations issued from 2005 through 2008 have similarly complicated structures. As such, the universe of "simple" tobacco bonds that were issued during this period is small, making it

hard to draw any broad conclusion as to the effectiveness of complexity in delivering more favorable pricing to the issuer.

V. TOBACCO SECURITIZATION CASE STUDIES

V.1: South Carolina's 2008 Securitization

V.1.a: State Tobacco Securitization History

South Carolina was one of the first states to securitize its TSRs, after Alabama and Alaska. In 2000, the State created the Tobacco Settlement Revenue Management Authority ("TSRMA"), and pledged to that entity 100% of the roughly 1.18% of the total national TSRs it had been allocated. In 2001, the TSRMA sold $934 million of TSR-backed bonds (the "SC 2001 Securitization"), consisting of $200 million in taxable bonds and $734 million in tax-exempt bonds. This was a very significant financing for South Carolina; at the time, it was the "biggest single bond issue in South Carolina history." (South Carolina Office of the State Treasuer, 2001).

On June 20, 2008, the tax-exempt portion of this bond issue was refunded by a $275 million issue (the "SC 2008 Securitization"), which I will examine here.

V.1.b: Budgetary Context and Use of Securitization Proceeds

The proceeds of the SC 2001 Securitization were deposited into several state trust funds intended to support programs for smoking cessation, economic development, and local governments, rather than the state's general fund. The SC 2008 Securitization did not contain a new money portion, and thus did not deliver any new proceeds to either the trusts or the state's general fund.

V.1.c: Securitization Structure

The SC 2008 Securitization's single tranche was structured as follows:

	Obligation at Issuance	Stated Maturity	Base Case[4] Maturity	4% Decline[5] Maturity
Tobacco Settlement Asset-Backed Refunding Bonds (2018)	$275,730,000	6/1/2018	6/1/2012	6/1/2012

All available excess TSRs were allocated to turbo redemptions on this tranche. These structuring assumptions and issue size were conservative, resulting in an estimated debt service coverage ratio of between 2.5x and 2.9x.

The high level of security with which the SC 2008 Securitization was structured is reflected in its projected maturity dates. Both the "Base Case" and all of the stressed cigarette sales scenarios result in the bonds being fully redeemed as of June 1, 2012.

V.2.d: Pricing at Issuance

To analyze the pricing of the tobacco securitizations discussed in this paper, I compared their constituent bonds' stated yields[6] to credit risk-free tax-exempt rates on the bonds' initial offering dates. For these analyses, I chose to use SIFMA swap rates as the benchmark yield curve due to the unavailability of historical Bloomberg municipal market yield curves on the bonds' offering dates, and the ability to use standard swap models[7] to customize the term of the comparative synthetic security to match the projected maturity of the bonds.

The comparison of the stated yields of the SC 2008 Securitization with the modeled SIFMA rates produced the following results:

	CUSIP	Projected Maturity	Stated Yield	SIFMA Swap Rate	Spread
Series 2008 Bonds (2018)	888806BD7	6/1/2012	5.13%	3.13%	2.00%

[4] Using TSR projections based on the "Base Case" cigarette sales assumption from the Global Insight report
[5] Using TSR projections based on a flat 4% annual decline in cigarette sales
[6] Per the issues' respective offering documents
[7] In this case, Bloomberg's Swap Manager (SWPM) function

To provide a point of comparison for the observed spread, I performed the same comparison on a State of South Carolina General Obligation bond with a similar sale date (June 5, 2008) and projected maturity:

	CUSIP	Maturity	Stated Yield	SIFMA Swap Rate	Spread
Series 2008B (2012)	83710DL55	6/1/2012	2.85%	2.85%	0.00%

As shown in the above tables, the SC 2008 Securitization priced at a significantly higher spread to the SIFMA swap rate than that of South Carolina's contemporaneous General Obligation bonds. While this is an intuitive result given the relative risk of tobacco settlement cash flows versus the State of South Carolina's taxing power[8], it is a significantly higher spread than one would expect given the pricing of the California and Ohio securitizations, as discussed later.

V.2.e: Payment Performance

Unlike many tobacco bonds, the SC 2008 Securitization has been paid according to schedule. While the TSRs were lower than anticipated, the high coverage with which the bonds were structured the bonds provided plenty of "headroom" to absorb the effects of the reduction in revenues. As such, the SC 2008 Securitization was fully redeemed in June of 2012 as scheduled.

V.2: California's 2007 Securitization

V.2.a: State Tobacco Securitization History

[8] The state was rated AA+ by S&P at the time of issuance

Due to its large population, the State of California was allocated roughly 12.76% of the total national annual TSRs. The State allocated half of this share to its general fund, then pledged the other half to California cities and counties[9]. To issue its tobacco bonds, the state created the Golden State Tobacco Securitization Corporation ("GSTSC"), and initially pledged 56.57% of its TSR share to GSTSC. In January 2003, GSTSC executed its first transaction, a $3 billion bond issue backed by this initial 56.57% pledge[10]. On March 8, 2007, this bond issue was refunded by the securitization examined in this paper, the Tobacco Settlement Asset-Backed Bonds, Series 2007 (the "CA 2007 Securitization").

V.2.b: Budgetary Context and Use of Securitization Proceeds

California's state budget was under distress at the times of the issuance of both the 2003 and 2007 securitizations. In 2002, in the wake of the dot-com bust, California faced a budget crisis due to its high reliance on income tax as a source of general fund revenue. The 2003 GSTSC transaction helped stabilize California's budget by providing the state's general fund with a large chunk of up-front cash. (Jones, 2002)

California again faced budget issues in 2007, and used the CA 2007 Securitization to help plug this hole. Although the bulk of the over $4.4 billion in proceeds generated were used to refund the 2003 securitization, a ~$1.3 billion "new money" component to was transferred to California's general fund.

V.2.c: Securitization Structure

[9] Some of which, incidentally, also securitized their shares
[10] GSTSC also issued additional bonds in 2003, 2005, 2006, 2013, and 2015 under separate indentures and pledges

The CA 2007 Securitization's structure followed the template set by earlier tobacco bond issues, and widely used during this time period, featuring seven tranches of bonds, including two CABs:

	Obligation at Issuance	Stated Maturity	Base Case Maturity	4% Decline Maturity	S&P Ratings[11]
2007A-2 Senior Current Interest Serial Bonds	$289,930,000	6/1/2008-6/1/2017	6/1/2008-6/1/2017	6/1/2008-6/1/2017	BBB/BBB+
2007A-1 Senior Current Interest Turbo Term Bonds (2027)	$863,100,000	6/1/2027	6/1/2017	6/1/2023	BBB/B
2007A-1 Senior Current Interest Turbo Term Bonds (2033)	$610,525,000	6/1/2033	6/1/2021	6/1/2030	BBB/B-
2007A-1 Senior Current Interest Turbo Term Bonds (2047)	$1,943,575,000	6/1/2047	6/1/2029	6/1/2047	BBB/B-
2007A-2 Senior Convertible Bonds	$389,192,591	6/1/2037	6/1/2023	6/1/2036	BBB/B-
2007B First Subordinate CABs	$271,957,065	6/1/2047	6/1/2032	"Maybe never"	BBB/CCC+
2007C Second Subordinate CABs	$78,546,735	6/1/2047	6/1/2033	"Maybe never"	BBB-/CCC

All of these tranches, with the exception of the first tranche of serial bonds, are subject to turbo redemption. As such, like those for the SC 2008 Securitization, the CA 2007 Securitization offering documents (Golden State Tobacco Securitization Corporation, 2007) used the Global Insight report to project maturity dates for different TSR revenue scenarios. We can see the effect of tranching in these projections - note that, even under the "4% Decline" scenario, the higher-priority tranches have both an earlier (versus stated) projected maturity, and a projected maturity that is less sensitive to the difference between the "Base Case" and "4% Decline" scenario.

[11] At Issuance/Current, Per Bloomberg as of 3/1/2017

By contrast, the lower-priority CABs are so sensitive to declines in available TSRs (largely due to the compounding effect discussed earlier), that the CA 2007 Securitization offering documents state that "[in] the event of an Annual Consumption Decline of 3.5% or 4.0% and taking into account the Cash Flow Assumptions outlined herein, the Series 2007C Second Subordinate CABs may never be paid." The CA 2007 Securitization was also structured and sized with lower debt service coverage ratios (ranging from 1.23x to 1.76x) than those of the SC 2008 Securitization.

The CA 2007 Securitization also included a tranche of convertible bonds. These bonds, like CABs, paid no coupons and accrued interest to their principal balance until their conversion date of December 1, 2012. After the conversion date, they became standard coupon-bearing bonds similar to the CA 2007 Securitization's other current interest tranches.

The CA 2007 Securitization's cash flow and debt service coverage projections also assumed that its $253 million reserve fund[12] would be invested at a rate of 4.68% throughout the life of the bonds. To realize a 4.68% return over this long time-period, GSTSC executed investment agreements with Lehman Brothers maturing in 2033 and 2047. The earnings from these agreements were to be used to supplement the TSRs to pay scheduled debt service and make turbo redemptions. However, Lehman stopped performing on the agreement following its 2008 bankruptcy, and GSTSC was forced to re-invest the CA 2007 Securitization's reserve fund at substantially lower market rates. This lower rate of realized return contributed to available revenue being less than forecast.

V.2.d: Pricing at Issuance

[12] A reserve fund is a pool of money set aside to pay required debt service if other money is not available to do so.

	CUSIP	Projected Maturity	Stated Yield	SIFMA Swap Rate	Spread
2007A-1 Senior Current Interest Serial Bonds (2012)	38122NNP3	6/1/2012	4.23%	3.41%	0.82%
2007A-1 Senior Current Interest Turbo Term Bonds (2027)	38122NNY4	6/1/2017	4.68%	3.57%	1.11%
2007A-1 Senior Current Interest Turbo Term Bonds (2033)	38122NNZ1	6/1/2021	5.16%	3.68%	1.48%
2007A-1 Senior Current Interest Turbo Term Bonds (2047)	38122NPB2	6/1/2029	5.27%	3.80%	1.47%
2007A-2 Senior Convertible Bonds	38122NPC0	6/1/2023	5.30%	3.71%	1.59%
2007B First Subordinate CABs	38122NPD8	6/1/2032	5.90%	3.82%	2.08%
2007B Second Subordinate CABs	38122NPE6	6/1/2033	6.00%	3.83%	2.17%

For comparison purposes, the following table shows the pricing of a contemporaneous State of California General Obligation Bond:

	CUSIP	Maturity	Stated Yield	SIFMA Swap Rate	Spread
General Obligation Refunding Bonds (2012)	13062TF41	8/1/2012	3.64%	3.47%	0.17%
General Obligation Refunding Bonds (2017)	13062TF90	8/1/2017	3.96%	3.70%	0.26%
General Obligation Refunding Bonds (2021)	13062TG57	8/1/2021	4.13%[13]	3.70%	0.43%
General Obligation Refunding Bonds (2027)	13062TH31	8/1/2027	4.56%	3.96%	0.60%

As discussed in further detail below, California appears to have realized favorable pricing relative to the Ohio and South Carolina securitizations, especially given the much lower risk profile of the latter transaction. For example, the 2007A-1 tranche (with a projected maturity of 2027) priced at only an 87 basis point spread difference to the similar-maturity General Obligation bond.

V.2.e: Payment Performance to Date

[13] Priced to 2017 call date

The effects of the CA 2007 Securitization's more aggressive structure, and resulting higher sensitivity to diminished available revenue, can be seen in the bonds' significantly higher than expected outstanding principal balances. As of 3/1/2017, the 2007A-1 Senior Current Interest Turbo Term Bonds (the first tranche subject to turbo redemption) have $543,550,000 in principal outstanding, as compared to the $57,635,000 projected under the Global Insight "Base Case" scenario. An even bigger indicator of the effect of diminished TSRs is that GSTSC has, on multiple occasions, been forced to draw on the bonds' reserve fund to pay interest and mandatory principal payments[14]. This distress is also reflected in the deterioration of the bonds' credit ratings shown in the above table.

V.3: Ohio's 2007 Securitization

V.3.a: State Tobacco Securitization History

The State of Ohio was allocated roughly 5.04% of the total national annual TSRs. Ohio was one of the later states to securitize its TSRs, creating the Buckeye Tobacco Settlement Financing Authority (BTSFA) as its securitization vehicle in June of 2007. On October 24, 2007, BTSFA performed its first (and only) tobacco securitization transaction, the Buckeye Tobacco Settlement Financing Authority Tobacco Settlement Asset-Backed Bonds, Series 2007 (the "OH 2007 Securitization"). At over $5.5 billion, the OH 2007 Securitization remains the largest TSR securitization ever undertaken.

V.3.b: Budgetary Context and Use of Securitization Proceeds

[14] Per municipal disclosure event filing notices dated 12/01/2011, 12/03/2012, 12/02/2015, and 12/01/2016

Ohio does not appear to have had budgetary problems at the time of the transaction, suggesting that the issuance of the OH 2007 Securitization was not intended raise funds to cover immediate budget deficits. The securitization proceeds were not, however, used to fund tobacco-related programs. Instead, Ohio used the proceeds to fund the construction of primary and secondary schools, an activity that would normally be funded with the state's general revenue sources.

V.3.c: Securitization Structure

The OH 2007 Securitization's structure is very similar to that of the CA 2007 Securitization. The issue features nine tranches (all subject to turbo redemption), including a tranche of convertible bonds like those used in the CA 2007 Securitization.

	Obligation at Issuance	Stated Maturity	Base Case Maturity	4% Decline Maturity	S&P Ratings[15]
2007A-1 Senior Current Interest Serial Bonds	$211,350,000	6/1/2009-6/1/2017	6/1/2009-6/1/2017	6/1/2009-6/1/2017	BBB/BBB+
2007A-2 Senior Current Interest Turbo Term Bonds (2024)	$1,149,530,000	6/1/2024	6/1/2017	6/1/2024	BBB/B-
2007A-2 Senior Current Interest Turbo Term Bonds (2030)	$687,600,000	6/1/2030	6/1/2020	6/1/2030	BBB/B-
2007A-2 Senior Current Interest Turbo Term Bonds (2034)	$505,200,000	6/1/2034	6/1/2022	6/1/2034	BBB/B-
2007A-2 Senior Current Interest Turbo Term Bonds (2042)	$250,000,000	6/1/2042	6/1/2026	6/1/2042	BBB/B-
2007A-2 Senior Current Interest Turbo Term Bonds (2047)	$2,133,750,000	6/1/2047	6/1/2028	6/1/2047	BBB/B-
2007A-3 Senior Convertible Bonds	$274,751,138	6/1/2037	6/1/2023	6/1/2037	BBB/B-
2007B First Subordinate CABs	$191,265,480	6/1/2047	6/1/2030	"Maybe never"	Not Rated
2007C Second Subordinate CABs	$128,182,923	6/1/2052	6/1/2031	"Maybe never"	Not Rated

[15] At Issuance/Current, Per Bloomberg as of 3/1/2017

The OH 2007 Securitization was issued with coverage ratios ranging from 1.20x through 1.92x, based on revenues projected in the Global Insight Base Case revenue assumption and reserve fund earnings of 4.682%. In yet another parallel to the CA 2007 Securitization's structure, BTSFA contracted with Lehman Brothers to lock in this 4.682% earnings yield, and likewise experienced the loss of this revenue stream after Lehman's bankruptcy.

V.3.d: Pricing at Issuance

	CUSIP	Projected Maturity	Stated Yield	SIFMA Swap Rate	Spread
2007A-1 Senior Current Interest Serial Bonds	118217AG3	6/1/2012	4.40%	3.21%	1.19%
2007A-2 Senior Current Interest Turbo Term Bonds (2024)	118217AN8/ 118217AP3	6/1/2017	5.44%	3.56%	1.88%
2007A-2 Senior Current Interest Turbo Term Bonds (2030)	118217AQ1	6/1/2020	5.95%	3.70%	2.25%
2007A-2 Senior Current Interest Turbo Term Bonds (2034)	118217AR9	6/1/2022	5.98%	3.78%	2.20%
2007A-2 Senior Current Interest Turbo Term Bonds (2042)	118217AS7	6/1/2026	6.09%	3.88%	2.21%
2007A-2 Senior Current Interest Turbo Term Bonds (2047)	118217AT5/ 118217AU2	6/1/2028	6.07%	3.92%	2.15%
2007A-3 Senior Convertible Bonds	118217AV0	6/1/2023	6.25%	3.81%	2.44%
2007B First Subordinate CABs	118217AW8	6/1/2030	7.25%	3.95%	3.29%
2007C Second Subordinate CABs	118217AX6	6/1/2031	7.50%	3.96%	3.54%

For comparison purposes, the following table shows the pricing of a contemporaneous State of Ohio General Obligation Bond:

	CUSIP	Projected Maturity	Stated Yield[16]	SIFMA Swap Rate	Spread
2007A General Obligation Bonds (2017)	677520XW3	9/1/2017	3.98%	3.82%	0.16%
2007A General Obligation Bonds (2020)	677520XZ6	9/1/2020	4.22%	3.79%	0.43%
2007A General Obligation Bonds (2022)	677520YB8	6/1/2022	4.33%	3.79%	0.54%
2007A General Obligation Bonds (2027)	677520YF9	6/1/2026	4.65%	3.79%	0.86%

V.3.e: Payment Performance to Date

As could be expected given their matching structures, the factors that affected the payment performance of the CA 2007 Securitization also affected the OH 2007 Securitization. The 2007A-2 tranche currently has $1,019,310,000 outstanding as compared to the $122,110,000 projected outstanding balance as of June 1, 2016. Like GSTSC, BTSFA has been forced to draw on its Reserve Fund to meet mandatory principal and interest payments[17].

VI: DISCUSSION

VI.1: Purpose

In analyzing the effect of the MSA on smoking, many have suggested TSRs ought to be directed toward public health initiatives that help reduce smoking-related illness. Under that assumption, it would follow that states' decision to use tobacco securitization, versus simply collecting TSRs on an ongoing basis, ought to advance public health goals as well. Indeed, tobacco securitizations can be a useful tool in doing so, when used correctly.

[16] The 2020, 2022, and 2027 bonds were priced to a 3/1/2017 call, which is reflected in the swap rate used for comparison purposes.
[17] Per municipal disclosure filings, the OH 2007 Securitization has required reserve draws every year since 2011

First, securitization bonds can, theoretically, better align states' economic incentives with these public health goals. As discussed by Haile, the TSR stream theoretically created a conflict of interest by giving states an (effective) share of cigarette sales. Haile's theory was that securitization transfers this share to bondholders and thus resolves the conflict[18].

Securitization can also help further public health by binding future revenue to health spending specifically. Money raised through tobacco bonds can be spent directly on health-related capital projects, or deposited in trust funds that are restricted to public health spending. When securitized, future TSRs are bound to pay to bond debt service, ensuring that those funds cannot be diverted away from these public health programs toward other, non-health-related purposes. The SC2008 Securitization, which directed its proceeds to several state trust funds, is an example of using tobacco bonds as this type of mechanism.

However, securitization will, of course, have the opposite effect when proceeds are directed toward non-health purposes up-front, as was done by many states. In this case, the encumbrance of TSRs means they cannot be used to fund health programs in the future. As with any government financing, the intentions of the current government have a significant impact on the flexibility of future governments to use future revenue streams for future purposes.

Based on their actions in the issuance of tobacco bonds, many states appear to have viewed the TSRs, and any resulting proceeds from their securitization, simply as fungible money. This is supported by Johnson, Kioko, and Abbas' finding that states which securitized their TSRs spent less money on anti-tobacco programs. States' primary goals appear to have been

[18] This is an interesting point, though it should be noted that it is somewhat in conflict with the legal theory of the MSA itself, which was that a higher incidence of smoking would lead to the state spending more on healthcare. This effect, in and of itself, creates a negative economic incentive for states to encourage or fail to discourage smoking. However, because healthcare spending may be delayed, whereas cigarette revenue is immediate, it is fair to suggest that states may prioritize increasing revenues over reducing future healthcare expenses.

that of any issuer of asset-backed securities – that is, to generate upfront cash and reduce their exposure to declines in future cash flows. While is it hard to say, from an ex-ante perspective, whether the yield premium (over other financing sources) paid to effect this risk transfer was appropriately priced, the subsequent decline in TSRs does suggest that states' desire to transfer this risk was, in hindsight, well-founded.

VI.2: Pricing Variances

As shown in the tables above, the CA 2007 Securitization priced at the lowest spreads to benchmark rates, and at spreads noticeably lower than those seen in the pricing of the similarly-structured OH 2007 Securitization. The difference between these transactions' long-term, high-risk CABs is particularly notable: California's spreads were over 100 basis points lower than Ohio's. The pricing of the SC 2008 Securitization is also indicative of the variance in issuance pricing. Even the some of the long-term, junior tranches of the CA 2007 Securitization were sold at lower spreads than the short-term, senior bonds in the SC 2008 Securitization.

The difference between the California/Ohio securitizations and the South Carolina securitization is especially stark given the subsequent performance of these bonds: CA 2007 Securitization bonds that sold at a +159 basis point spread to the benchmark now carry "junk" ratings, whereas the SC 2008 Securitization, issued at +200 basis point spread, has been fully redeemed. The OH 2007 Securitization also featured now-"junk" bonds that priced at a +188 basis point spread.

At first glance, these observations suggest that there may have been a benefit to issuer size in the pricing of the complex tobacco securitizations done in the 2005-2008 period. California, with its large –and possibly more sophisticated– investor base, would appear to have leveraged this advantage to realize more favorable issuance yields than South Carolina or Ohio.

However, while California may have derived some benefit from its large bond market, looking at a broader selection of tobacco securitizations does not suggest that this was a systematic occurrence.

To examine the potential relationship between issuer size and tobacco securitization pricing, I analyzed the issuance pricing of 52 U.S. state tobacco securitization tranches issued between November 2005 and June 2008. To account for differences in state tax rates and tranche tax-exemption status, I adjusted the issuance yield for each federal/state tax-exempt tranche to its "taxable-equivalent" by grossing up the yield at issuance using the following formula:

$$Yield_{Taxable-Equivalent} = \frac{Yield_{Tax-Exempt}}{(1 - (Tax\ Rate_{Federal} + Tax\ Rate_{State}))}$$

The taxable-equivalent yields were compared to similar-maturity[19] U.S. Treasury yields to estimate each tranche's yield spread to the U.S. dollar risk-free rate. Tranches were categorized by tranche type[20] so that their spreads could be compared to other securities with a similar credit risk profile. The tranches were also categorized into three issuer size buckets[21].

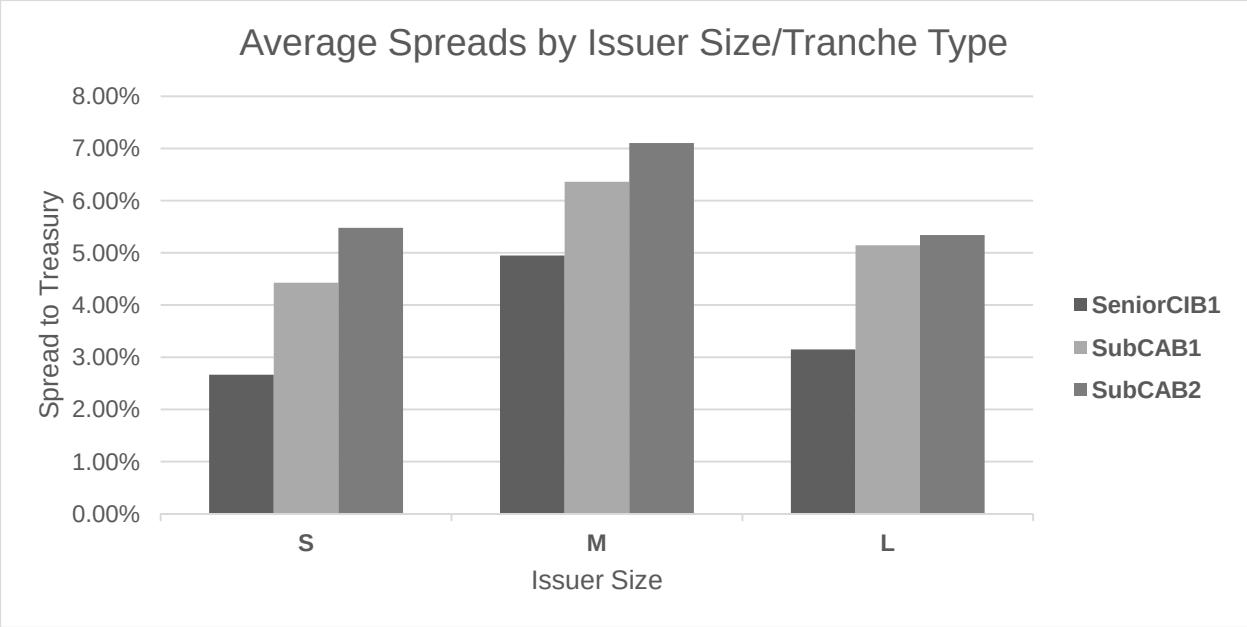
Using this data[22], I computed average spreads for each combination of tranche type and issuer size bucket. The spreads for three common tranche types across the three size buckets are shown in the chart below:

[19] Using each tranche's projected final turbo redemption date under the Global Insight Base Case as its maturity date

[20] Such as "SeniorCIB1", meaning a Current Interest Bond - Tranche Level 1 (among CIBs), "SubCAB1", meaning a Capital Appreciation Bond - Tranche Level 1 (among CABs), etc.

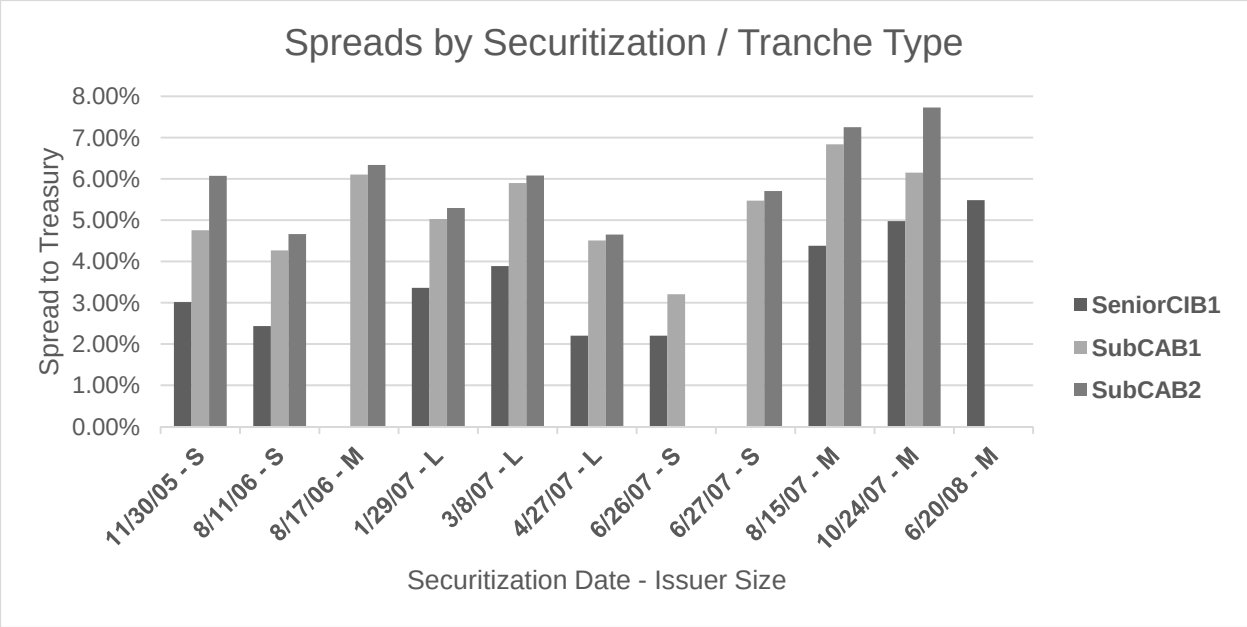
[21] Defined by the issuer's outstanding governmental debt, as reported in each issuer's Comprehensive Annual Financial Report (as of a date contemporaneous with the tobacco securitization issuance). "Small" = $900mm - $2.5bn in outstanding debt, "Medium" = $4.4bn - $11.5bn, "Large" = $17.8bn - $64bn

[22] Further detail available in the Appendix



Based on this analysis, the spreads realized by larger issuers do not appear to be consistently lower than those realized by smaller issuers. The set of securities issued by medium-sized issuers traded at the highest spreads, and the difference in spreads between the small and large issuers were not significantly different, suggesting that issuer size was not a directly measurable factor in transaction pricing.

I also explored the possibility that the time of issuance affected pricing spreads. The following chart shows the spreads of same three tranche types for each securitization:



While there is no broadly consistent result in this analysis either, it does appear that some of the later securitizations, including the OH 2007 Securitization (10/24/07), the SC 2008 Securitization (6/20/08), and Michigan's securitization (8/15/07) priced at higher spreads than earlier transactions. It is possible that the market for tobacco bonds became somewhat saturated at some point in 2007, which would help explain the pricing differences observed between the similarly-structured and sized CA 2007 Securitization and OH 2007 Securitization, as well as the relatively high pricing of the much more conservative SC 2008 Securitization. This would also help explain why medium-sized issuers happened to have higher transaction spreads in the previous analysis, given that three of the four medium-sized-issuer securitizations occurred in late 2007 and 2008.

In general, however, it is hard to draw solid general conclusions from the data. The universe of tobacco securitizations is relatively small, and while many in this period followed the same template, there are still structural differences that can produce pricing differences. In short,

the initial pricing of tobacco securitization bonds, as Nuveen observed regarding their secondary market investment characteristics, appears to have been situationally-specific.

VII: APPENDIX

Average Spread Data by Tranche Type/Issuer Size Bucket

Issuer Size	Tranche Type	Average Treasury Spread
S	SeniorCIB1	2.666%
S	SeniorCIB2	3.460%
S	SeniorCIB3	3.499%
S	SeniorCIB4	4.128%
S	SubCAB1	4.427%
S	SubCAB2	5.479%
S	SubCAB3	6.821%
M	SeniorCIB1	4.947%
M	SeniorCIB2	5.462%
M	SeniorCIB3	5.446%
M	SeniorCIB4	5.776%
M	SeniorCIB5	5.699%
M	SubCAB1	6.363%
M	SubCAB2	7.105%
M	SubCAB3	7.718%
M	SubCAB4	7.985%
L	SeniorCIB1	3.150%
L	SeniorCIB2	4.014%
L	SeniorCIB3	4.169%
L	SeniorCIB4	4.259%
L	SeniorCIB5	3.881%
L	SubCAB1	5.145%
L	SubCAB2	5.342%

Tranche-Level Spread Data for Each Securitization Analyzed

Issue Date	Securitization	Issuer Size	Tranche Type	Treasury Spread
11/30/05	IA2005	S	SeniorCIB1	3.015%
11/30/05	IA2005	S	SeniorCIB2	4.103%
11/30/05	IA2005	S	SeniorCIB3	4.130%
11/30/05	IA2005	S	SeniorCIB4	4.128%
11/30/05	IA2005	S	SubCAB1	4.757%
11/30/05	IA2005	S	SubCAB2	6.071%
8/11/06	AK2006A	S	SeniorCIB1	2.435%
8/11/06	AK2006A	S	SeniorCIB2	2.817%

8/11/06	AK2006A	S	SeniorCIB3	2.867%
8/11/06	AK2006A	S	SubCAB1	4.268%
8/11/06	AK2006A	S	SubCAB2	4.662%
8/17/06	DC2006	M	SubCAB1	6.103%
8/17/06	DC2006	M	SubCAB2	6.335%
8/17/06	DC2006	M	SubCAB3	7.275%
8/17/06	DC2006	M	SubCAB4	7.985%
1/29/07	NJ2007-1	L	SeniorCIB1	3.360%
1/29/07	NJ2007-1	L	SeniorCIB2	3.731%
1/29/07	NJ2007-1	L	SeniorCIB3	3.782%
1/29/07	NJ2007-1	L	SeniorCIB4	3.777%
1/29/07	NJ2007-1	L	SeniorCIB5	3.881%
1/29/07	NJ2007-1	L	SubCAB1	5.027%
1/29/07	NJ2007-1	L	SubCAB2	5.295%
3/8/07	CA2007	L	SeniorCIB1	3.887%
3/8/07	CA2007	L	SeniorCIB2	4.657%
3/8/07	CA2007	L	SeniorCIB3	4.862%
3/8/07	CA2007	L	SeniorCIB4	4.741%
3/8/07	CA2007	L	SubCAB1	5.900%
3/8/07	CA2007	L	SubCAB2	6.079%
4/27/07	VA2007	L	SeniorCIB1	2.203%
4/27/07	VA2007	L	SeniorCIB2	3.654%
4/27/07	VA2007	L	SeniorCIB3	3.864%
4/27/07	VA2007	L	SubCAB1	4.507%
4/27/07	VA2007	L	SubCAB2	4.651%
6/26/07	WV2007	S	SeniorCIB1	2.200%
6/26/07	WV2007	S	SubCAB1	3.207%
6/27/07	RI2007	S	SubCAB1	5.474%
6/27/07	RI2007	S	SubCAB2	5.705%
6/27/07	RI2007	S	SubCAB3	6.821%
8/15/07	MI2007	M	SeniorCIB1	4.380%
8/15/07	MI2007	M	SeniorCIB2	5.190%
8/15/07	MI2007	M	SeniorCIB3	5.172%
8/15/07	MI2007	M	SubCAB1	6.836%
8/15/07	MI2007	M	SubCAB2	7.253%
10/24/07	OH2007	M	SeniorCIB1	4.977%
10/24/07	OH2007	M	SeniorCIB2	5.735%
10/24/07	OH2007	M	SeniorCIB3	5.720%
10/24/07	OH2007	M	SeniorCIB4	5.776%
10/24/07	OH2007	M	SeniorCIB5	5.699%
10/24/07	OH2007	M	SubCAB1	6.149%
10/24/07	OH2007	M	SubCAB2	7.728%
10/24/07	OH2007	M	SubCAB3	8.161%
6/20/08	SC2008	M	SeniorCIB1	5.485%

Works Cited

Chappatta, B. (2016, May 16). *Tobacco Bond Ratings from Fitch Will Be Withdrawn in 30 Days*. Retrieved from Bloomberg.com: https://www.bloomberg.com/news/articles/2016-05-16/all-tobacco-bond-ratings-from-fitch-will-be-withdrawn-in-30-days

Golden State Tobacco Securitization Corporation. (2007, March 8). Official Statement - Tobacco Settlement Asset-Backed Bonds, Series 2007. Sacramento, California, United States of America.

Goldman Sachs. (2007, April 10). Response to Request for Statement of Qualifications - State of Rhode Island Tobacco Settlement Financing Corporation. New York, New York, United States of America.

Haile, A. J. (2009). Sin Taxes: When the State Becomes the Sinner. *Temple Law Review, 82*(4), 1041-1070.

Janofsky, M. (1994, May 24). *Mississippi Seeks Damages From Tobacco Companies*. Retrieved from The New York Times: http://www.nytimes.com/1994/05/24/us/mississippi-seeks-damages-from-tobacco-companies.html

Johnson, D. C., Kioko, D. S., & Abbas, Y. (2013, April 4). Tobacco Securitization & Public Spending. *Albany Government Law Review*, 21-49.

Jones, G. (2002, November 2). *State Needs Fast Billions to Deal With Budget Crisis*. Retrieved from The Los Angeles Times: http://articles.latimes.com/2002/nov/02/local/me-budget2

Moody's Global Credit Research. (2015, July 6). *Moody's*. Retrieved from Moody's Investors Service: https://www.moodys.com/research/Moodys-takes-rating-actions-on-tobacco-settlement-revenue-securitizations--PR_329262

Nuveen Asset Management. (2016, May). *Tobacco Bonds: Careful Credit Analysis Is the Key*. Retrieved from Nuveen: https://www.nuveen.com/Home/Documents/Default.aspx?fileId=63396

South Carolina Office of the State Treasuer. (2001, March 22). *Tobacco Money Is In the Bank*. Retrieved from South Carolina Office of the State Treasuer: http://www.state.sc.us/treas/OS/NewRelease/Files/010322tobacco-in.htm