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In or Out? Explaining State Shares of the Tobacco Master Settlement Agreement

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ABSTRACT *In 1998, 46 states were involved in a Master Settlement Agreement (MSA) with the tobacco industry. The other four states settled on their own. Our goal is to answer a counter factual question: how would these four states have fared had they been included in the MSA? We use data from Viscusi (2002) to explain settlement shares for states participating in the 1998 tobacco MSA, and to predict settlement shares for the four nonparticipating states. We find that two nonparticipating states (Minnesota and Mississippi) may have fared substantially worse had they been included in the MSA.*

Key Words: Tobacco Industry; Tobacco Master Settlement Agreement.

JEL Classifications: L6, K3.

1. Introduction

The 1998 Master Settlement Agreement (MSA) between the tobacco industry and 46 states has generated much criticism, from two distinct points of view. Some feel that the agreement shortchanged the states in that the settlement amount did not cover comprehensively all smoking-related medical costs incurred by the states.[1] Others argue that, independent of the settlement, these medical costs were already self-financed by excise taxes and smokers' low life expectancies compared to nonsmokers.[2] The core of this debate has hinged on the definition and measurement of medical costs imposed by smokers on the state. While there are many lessons to learn from this debate, we are going to completely sidestep this controversy. Instead, our goal is to examine what we believe is a previously unanswered question concerning the four states that negotiated their own settlement outside of the MSA: how would these states have fared had they been included in the MSA?

The tobacco industry was the first to face a MSA from a concerted effort of a majority of the states, but it may not be the last. The gun, fast food, alcohol, and

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automobile industries all sell products that have come under constant scrutiny of social regulators and civil litigators. While there has been substantial debate about the sense or nonsense of the MSA approach, there is no ignoring the fact that the states reaped large financial gains from the tobacco industry.[3] If MSA's have become a political reality, the lessons from the tobacco settlement are likely to affect how the participating states will approach their next set of negotiations.

Because the negotiations between the tobacco industry, the participating states, and the nonparticipating states took place roughly at the same time, the participating states may not have had the opportunity to learn much from the settlement deals that the nonparticipating states accepted. But if there is another settlement agreement between the states and some other industry, undoubtedly the participating states will look back at the tobacco MSA and compare their negotiated outcomes with those of the nonparticipating states. To the extent that the nonparticipating states negotiated favorable deals relative to the MSA outcomes, the likelihood of successful future MSA's is in doubt.[4]

To examine the counter factual of how the four nonparticipating would have fared had they been included in the MSA, we first must explain the variation in the participating states' payment shares. In doing so, we rely on data presented in Viscusi's (2002) book *SmokeFilled Rooms*. While Viscusi is well established as a critic of the states' claim against the tobacco industry, in using his data we are not intending to endorse or criticize his empirical approach or conclusions. We simply use his data for pragmatic purposes.

We want to be completely clear about the limitations of our empirical analysis. We lack the ability to address directly why four states chose to negotiate their own settlements. We also cannot explain all the political considerations that were behind the secret negotiations between the participating states and the tobacco industry. Relying on simple regression analysis, however, we are able to explain much of the variation in the participating states' payment shares with intuitively pleasing variables. We then use these regressions to predict the nonparticipating states' payment shares and compare the counter factual settlement amounts to the actual amounts, always being careful to document the shortcomings of our approach as we proceed. Our results suggest that two of the four nonparticipating states (Minnesota and Mississippi) may have fared substantially worse had they been included in the MSA.

2. Viscusi's Data

Viscusi's approach to measuring smoking-related medical costs has been well-documented elsewhere, so we will just highlight some key points.[5] For each state, Viscusi estimates a present value per pack differential between medical costs attributed to smokers and medical costs attributed to nonsmokers.[6] These per pack costs are then used to generate total medical costs when they are multiplied by the total number of packs sold in a state. From these total costs, each state can be assigned a medical cost share.

Viscusi argues that if the settlement agreement was meant solely to cover medical costs, each state's medical cost share would match its settlement share perfectly. However, this is not the case. For example, Kentucky's settlement share is only 64% of its medical cost share, while California's settlement share is 152% of its medical cost share.[7] Viscusi accounts for this variation by pointing to the highly politicized nature of the MSA.

Table 1. Descriptive statistics—46 participating States vs. nonparticipating states

	Percentage of settlement share	Percent medical share	Population (1,000s)	Tobacco producer state dummy	Packs of cigarettes sold
Mean	2.174	2.174	4948.261	0.326	406,440,920
Maximum	12.997	15.275	32667	1	1,668,402,703
Minimum	0.253	0.179	481	0	28,431,000
Standard Deviation	0.7213	2.6972	5605.402	0.4740	368,711,742
Florida	N/A	5.599	14916	1	1,316,805,882
Minnesota	N/A	1.964	4725	0	384,237,500
Mississippi	N/A	0.817	2752	0	290,666,667
Texas	N/A	5.426	19760	0	1,357,326,829

We use Viscusi's medical cost shares for the 46 participating states, and other explanatory variables we have collected, to take a closer look at the variation in settlement shares across the participating states.[8] The key variables of interest we include as explanatory variables are: state medical cost share; state population; state number of packs of cigarettes sold; and whether or not the state is a tobacco producer. As discussed by Viscusi, we expect the medical cost share to have a positive effect on the settlement share. If large population states have more clout at the negotiation table than smaller states, we also expect the population variable to have a positive effect on the settlement share. If states that sell a large number of packs of cigarettes or are tobacco-producing are to some extent ostracized at the negotiation table, we expect those variables to have a negative effect on the settlement share. The descriptive statistics for all of the variables we use are reported in Table 1.

3. Regression Results

Table 2 presents our regression results, with state settlement share as the dependent variable. Viscusi's observation of a lack of a one-to-one relationship between settlement shares and medical costs shares can be explained by the influence of other factors we identify in the three regression equations. Equation 1 demonstrates the two main influences on the settlement share–medical cost share and state population.[9] Both of these variables have a significant positive effect on the settlement share, and taken together they explain 97% of the variation in settlement shares.

Equation 2 adds two explanatory variables to the regression: the total number of packs of cigarettes sold in the state and a binary variable equal to 1 for tobacco producing states.[10] The packs sold variable has a significant negative effect on the settlement share, but the tobacco producer variable is not significant. While Viscusi (2002: 49) briefly mentions that some tobacco producing states did not fare well in the MSA, our results suggest a negative settlement effect related to the consumption, as opposed to the production, of tobacco.

Equation 3, however, offers a closer look at the potential bias against tobacco producing states. Of the 15 tobacco producing states, six produce a substantial amount more than the other nine.[11] Using three mutually exclusive binary variables to account for the six tobacco producing states that produce the most, the

Table 2. Regression results for 46 participating states

Independent variables	Dependent variable		
	Percentage share of settlement (1)	Percentage share of settlement (2)	Percentage share of settlement (3)
Constant	–0.1871 (–2.57)**	0.032591 (0.62)	0.207883 (1.06)
Percent medical share	0.506556 (6.75)***	0.593709 (21.16)***	0.582218 (18.56)***
Population	0.000255 (8.51)***	0.000355 (13.07)***	0.000341 (12.06)***
Packs of cigarettes sold		–2.29E–09 (–3.63)***	–1.98E–09 (–3.20)***
Tobacco producer state dummy		0.077703 (0.41)	
Six largest tobacco producing states dummy			–0.435787 (–1.92)*
Nontobacco producing states dummy			–0.188731 (–1.03)
F-Stat	746.0425***	673.0835***	603.1122***
Adjusted R^2	0.971	0.984	0.985

Notes:The t-statistics are in parentheses. ***significant at the 1% level, **significant at the 5% level, *significant at the 10% level.
A White test indicated the presence of heteroskedasticity in each specification and this was corrected using White's standard errors.

other nine producing states, and the 31 nonproducing states, we can distinguish between the three categories. Using the nine smallest tobacco producing states as the omitted variable, equation 3 demonstrates weak support for a negative effect on the settlement share of the six largest tobacco states relative to the next nine, but no significant effect of the nonproducing states relative to the nine smallest tobacco states.[12]

4. Nonparticipating States' Predicted Shares

One feature of our regression analysis is that it allows us to predict what the settlement shares may have been for the four nonparticipating states–Florida, Minnesota, Mississippi, and Texas. To find these predicted shares, we needed to generate these states' medical cost shares, because Viscusi has not reported them. To do this, we followed Viscusi's procedure and calculated the *total* medical cost (i.e. per pack medical cost multiplied by the total number of packs sold) for each of the 46 states, and then added in a single nonparticipating state's total medical cost to generate a 47 state medical cost share.[13] We repeated this procedure until we had a medical cost share for each nonparticipating state, as shown in Table 1.

Using the medical cost share and other explanatory variables, we calculated a predicted settlement share for each nonparticipating state using each of the three regression equations.[14] These settlement shares are reported in Table 3.[15] Texas had the highest predicted share, followed by Florida, Minnesota, and Mississippi.

It is fairly apparent from our regression results that the two states with the largest populations and medical cost shares were predicted to fare better in the MSA than were the two other states. What is less obvious, however, is whether or not each state would have fared better included in the MSA than they did by

Table 3. Predicted settlement shares and Dollar amounts

	Predicted settlement share	Predicted Dollar amount* (Billions)	Ratio: actual/predicted**
Florida			
Regression #1	6.447	12.40	0.911
Regression #2	5.713	10.99	1.028
Regression #3	5.953	11.45	0.987
Minnesota			
Regression #1	2.011	3.87	1.577
Regression #2	1.995	3.84	1.589
Regression #3	2.015	3.88	1.574
Mississippi			
Regression #1	0.927	1.784	2.018
Regression #2	0.829	1.594	2.258
Regression #3	0.859	1.652	2.179
Texas			
Regression #1	7.593	14.61	1.047
Regression #2	7.158	13.77	1.111
Regression #3	7.236	13.92	1.099

Notes:
*This is the predicted settlement share percentage multiplied by the MSA total settlement amount of $192.4 billion.
**The actual settlement amounts for the four nonparticipating states are as follows: Florida $11.3 billion, Minnesota $6.1 billion, Mississippi $3.6 billion, and Texas $15.3 billion.

opting out. To examine this point, specific dollar settlement amounts must be identified.

Exactly what dollar amounts to consider as settlement payments can be a complicated issue. For our purposes, we use commonly reported settlement amounts that allow for a consistent comparison between the 46 participating states and the four nonparticipating states. These amounts are $192.4 billion for the 46 states, $15.3 billion for Texas, $11.3 billion for Florida, $6.1 billion for Minnesota, and $3.6 billion for Mississippi.[16] All of these figures represent total nondiscounted amounts, to be paid over 25 years.[17]

Table 3 shows the predicted dollar amounts the four states would have received if part of the MSA, along with the ratios of the actual settlement amounts relative to the predicted amounts. For all specifications used, Minnesota, Mississippi, and Texas fared better by not participating in the MSA. The two smallest states actually fared *substantially* better on their own. Mississippi's actual settlement was more than double their predicted settlement, and Minnesota bettered their predicted settlement by nearly 60%.[18] Only Florida, for two of the specifications, may have slightly fared better included in the MSA.

In interpreting our results, we conclude that both Florida and Texas would have received similar settlement shares included in the MSA compared to what they received on their own. What we find most instructive is how well Minnesota and Mississippi did on their own. These results indicate that the small population states would have been at a huge disadvantage had they participated in the MSA.[19] To the extent that we can rely on the reported dollar amounts, we have shown how good the settlement figures of $6.1 billion for Minnesota and $3.6 billion for Mississippi were compared to the overall settlement amount of $192 billion for the participating states. Obviously, it is not just the expected share of the settlement each state has to worry about, but also the magnitude of the total settlement amount being shared.

5. Concluding Comment

We have shown that there are variables that can explain state settlement shares for the participants of the tobacco MSA. With the tobacco settlement, larger shares are associated with larger medical costs, larger populations, fewer packs of cigarettes sold, and not being one of the six largest tobacco producing states. To the extent that these master settlements are proposed in other industries, the lessons from the tobacco industry are likely to play a role in determining which states participate in the next agreement. States that are expected to command smaller than average shares may decide to opt out of the settlement, using Minnesota and Mississippi as their role models. But one must also consider how industry members will approach a future MSA. Will they be reluctant to deal with individual states that choose to opt out? Whatever the case, the tobacco MSA is likely to be closely scrutinized before the states and other industries attempt to negotiate a future similar agreement.

Notes

1. See, e.g., Coller *et al.* (2002) and Cutler *et al.* (2000).
2. See, e.g., Barendregt *et al.* (1997) and Viscusi (2002). The former study uses data from the Netherlands, but the basic results are reconfirmed by the latter study using data from the United States.
3. Discussions of the tobacco MSA can be found in Bulow and Klemperer (1998), Cutler *et al.* (2002), and Gruber (2001).
4. The nonparticipating states (and settlement dates) were: Mississippi (July 1997); Florida (August 1997); Texas (January 1998); and Minnesota (May 1998). See Bulow and Klemperer (1998: 337).
5. See Viscusi (2002: chapters 4 and 5).
6. See Viscusi (2002: table 7, pp. 96-97).
7. See Viscusi (2002: table 3, pp. 46-47).
8. Viscusi's (2002) medical cost shares for the 46 participating states are from 1995, and are reported in table 3, pp. 46-47. All other data are from 1998.
9. Population figures are taken from the Statistical Abstract of the United States, 1999, U.S. Census Bureau.
10. Total packs of cigarettes sold was found at the CDC web site www2.cdc.gov/nccdphp/osh/state/index.asp. Tobacco producer data was found in Agricultural Statistics, 2000, U.S. Department of Agriculture.
11. The six largest tobacco producing states are (from largest to smallest): North Carolina, Kentucky, Tennessee, Virginia, South Carolina, and Georgia. Georgia produced 90 million pounds of tobacco in 1998; the seventh largest (Ohio) produced only 17 million pounds.
12. Other specifications we examined included such variables as tobacco excise tax rates, percent of adult smokers, pounds of tobacco produced, and party affiliation of the governor. None of these variables were found to have a statistically significant effect on payment shares. Our results with respect to medical cost shares, population, and packs sold were robust to all specifications.
13. While Viscusi (2002) reports the medical cost shares for only the 46 participating states in table 3, pp. 46-47, he reports the per pack medical costs for all 50 states in table 7, pp. 96-97. We calculated each state's medical cost share based on 47 states (as opposed to including all 50 states) to keep the average share as close as possible to the original one in 46.
14. Of the four states, Florida is the only tobacco producer, but it is not in the top six.
15. Each state's predicted share assumed they were one out of 46 states, matching the number of observations in the regressions. We recognize that had one of these states joined the MSA, the

average settlement share would have been 1/47 as opposed to 1/46. Furthermore, had another state joined, the total settlement payment may have exceeded the $192.4 billion figure.

16. The total payments to each of the 46 participating states can be found in Appendix E at www.ncsl.org/statefed/tmsasumm.htm. Although the total payment amount is listed as $196 billion, this includes payments to D.C., Amer. Samoa, N. Mariana Islands, Guam, U.S. Virgin Islands, and Puerto Rico. Subtracting these payments leaves a total of $192.4 billion. Using this information, we were able to independently replicate Viscusi's payment shares, verifying that he also used $192.4 as the total payment base. The figures for the nonparticipating states can be found in Viscusi (2002: 37).
17. We recognize that these amounts can be very imprecise. They are not stated in present value terms, and the 25-year period does not include additional payments that may be made in perpetuity. Furthermore, the payments over the 25 years can be adjusted based on several factors, such as inflation, sales volume, and other offsets. Nevertheless, the amounts we use are commonly mentioned in the popular press and scholarly literature. Our goal at this time is simply to make *some* comparison between settlement amounts negotiated separately vs. those predicted as part of the MSA.
18. Viscusi (2002: 37)) reports two payment totals for Minnesota: $6.1 billion (p. 54) and $6.6 billion. Other sources report one of these two totals. Because we found Minnesota to have fared much better outside the MSA even with the $6.1 billion figure, we use that amount.
19. Even if our settlement figures provide an accurate description of the financial benefits of being excluded from the MSA, there may be other factors to consider. Participating in the MSA may have involved administrative costs savings, especially for states that were willing to play a less active role in drafting the settlement agreement. But this costs savings argument is mitigated by the fact that in addition to the settlement amounts stated, the tobacco companies have to make payments to compensate the states for legal and other administrative costs.

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