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TAX REFORM AND THE EFFECTS ON BANK INVESTMENT PORTFOLIOS AND BOND SPREADS

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Abstract

Commercial banks have traditionally been a primary force in the tax exempt bond market. The Tax Reform Act of 1986 provided major incentive changes. The purpose of this study is to investigate the motivation for bank participation in the municipal bond market in order to determine which theory, market segmentation versus excess funds, is the most predominant. Empirical results from yield and portfolio analyses most strongly support the excess funds motivation for commercial bank investment in municipal securities.

INTRODUCTION

Commercial banks have traditionally been the primary force in the tax exempt bond market. The Tax Reform Act of 1986 provided major incentive changes for banks. The Act eliminated the deductibility of carrying costs on many municipal bonds (80 percent under the old law) incurred and changed the interest income exemption on certain types of municipals.

The impact of the Act created several categories of municipals. First those bonds issued before August 7, 1986 retain their interest income exemption and the deductibility of carrying costs so long as they were purchased by a bank before that date. Second, public purpose bonds retain the exemption of interest income. Private purpose municipals are generally taxable. Third, the interest deduction on carrying costs is retained only on qualified public purpose bonds of state and local governments issuing less than $10 million in municipal bonds per year. Finally, while the marginal income tax rate was lowered, banks are now subject to 20 percent minimum tax that adds back preference items to taxable income.

These tax law changes would be expected to have notable effects on both bank investment strategies and municipal bond yields. Banks would be expected to shift away from municipal bonds toward taxable issues as tax-equivalent rates would generally be lowered by all of the tax law changes. In addition, one might expect yields on municipal bonds to rise to reflect the lower demand by commercial banks.

What actually occurs depends largely upon two factors. A primary factor is the extent to which municipals have actually been used to reduce Federal tax liability. According to a Bureau of Economic Analysis, corporations in general had an average tax rate of approximately 25 percent from 1980 to 1983. Gelfand and Hanweck [1986], however, estimate a direct tax rate for all banks in 1985 of only 11 percent. A study by the Joint Committee on Taxation found that large banks paid no more than 5 percent in direct taxes. It would appear that given the extent of tax avoidance in the banking industry, the municipal bond market plays a major role.

The second factor determining the effect of the tax change depends on the demand for municipal bonds by banks. One hypothesis is the "excess flow" view that holds that banks purchase tax-exempt bonds only when they have excess funds because banks are most concerned with servicing loan demand. (See Galpen and Peterson

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[1971], Rosenbloom [1976], or Kidwell and Peterson [1987] for example). If this view is correct factors other than funds availability, such as tax law changes, would have no impact on the municipal bond portfolios of banks.

If this view does not hold one could potentially observe two different effects. First, the composition of the bank's investment portfolio should change in response to the tax law changes. Second, the predominant role played by banks in the municipal bond market could alter the yield differential between municipal and similar taxable issues. This market segmentation view as an explanation of the yield spreads has been challenged by Campbell [1980] and Hendershott and Kidwell [1978]. Their findings suggest that when bank demand changes occur other market forces overcome the differentials eliminating possible segmentation. Their results do not, however, rule out possible segmentation effects over very short time periods.

Kidwell, Koch (1983) investigate the impact of market segmentation upon the yields of municipal securities relative to Treasury securities. An upward bias and steep slope are observed in the municipal yield curve over the Treasury yield curve, which is partially attributable to commercial bank preferences for short term municipals and lack of substitution across maturity structures by local governments.

Kidwell, Koch, and Stock (1984) examine the impact of state personal income tax differentials upon relative state and local government borrowing costs. Lower borrowing costs result in states that more aggressively tax the coupon interest of out of state municipal issuances, with the magnitude of the savings being directly related to the size of the tax differential. Noting the decline of the federal marginal tax rates brought about by the 1986 Tax Reform Act, Brucato, Forbes, and Leonard (1991) demonstrate an increase in the importance of state tax policy as applied to tax exempt investments. They observed state taxing actions broadened the effective tax differential between in and out of state bonds. This, however, did not induce observable yield differentials across states. Commercial bank demand decreased and the importance of bond insurance increased.

Petersen (1987) surveys the short term impact of the 1986 TRA on municipal securities, noting a pre-tax anticipatory effect of mass issuances, clogged markets, and last ditch attempts to earn arbitrage profit by simultaneously investing in higher yielding securities and/or conducting advanced refundings. Petersen predicts the tax changes will contribute to a more fragmented market which is complicated by caps on borrowing, reinvestment practices, and federal tax treatments. He further predicts a multi-tiered market in terms of interest cost differentials as well as a flatter tax-exempt yield curve invoked by loss of bank support and lowering of top marginal tax rates (rendering increases in short term interest rates).

Neubig and Sullivan (1987) analyze the potential for decreased bank demand for municipal securities induced by the 1986 Tax Reform Act in conjunction with the additional effects of declining corporate rates and bad debt reserve changes. After estimating bank demand for tax exempt bonds and simulating the effects of tax reform, the authors find banks will pay higher federal taxes in the future, but their after tax income will increase due to declining corporate rates and portfolio shifting away from some municipals and toward higher yielding taxable securities.

Scholes, Wilson, and Wolfson (1990) find significant inclination for bank investment policies to be formulated or changed by changes in tax codes. The presence of tax clienteles is partially established. Their work supports the premise that bank investment and financing policies are to an extent formulated by tradeoffs involved in tax cost/benefit analyses.

The purpose of this research is then to investigate the extent to which the hypothesized changes have occurred. Whether or not banks change their investment strategy as a result of a tax law change depends on their motives for holding tax-exempt investments. If banks primarily invest in municipals out of hometown loyalty or only when excess loan funds are available, then the tax law changes will have no noticeable effects. If, however, past tax preferences in the municipal bond market have effectively segmented potential buyers of these instruments then the Tax Reform Act of 1986 may well have had lasting effects on both bank portfolios and yield differentials between different bond markets. This research attempts to determine whether banks have reacted significantly to the recent tax law changes pertaining to tax-exempt securities.

The study proceeds with an explanation of the data and methodology in Section II. Empirical results are presented in Section III. Conclusions follow in Section IV.

DATA AND METHODOLOGY

The empirical research will consider two separate measures of the impact. First, the bond portfolios of all commercial banks before and after the tax law change are examined to determine if significant portfolio changes have occurred. The following ratios are computed for each bank using Call and Income Reports from the Federal Deposit Insurance Corporation (FDIC) datatapes.

- Tax Exempt Securities/Total Securities
- Total Securities/Total Assets
- Leasing Receivables/Total Loans and Leases

The first ratio measures the relative importance of municipals in the bond portfolio and should not significantly change if the excess funds view is correct. The second ratio measures the relative importance of bond holdings in general. If the tax law had a significant impact on returns generating capabilities we would expect this ratio to decline. The last ratio would be used to see if banks have substituted leasing receivables for tax-exempt bonds as a means of tax management.

These ratios are computed for the two years before and after the Tax Reform Act of 1986. Commercial banks are grouped by size and actual tax rates.

The second measure of the impact of the Tax Reform Act of 1986 focuses upon the segmentation view of bond markets and the yield differential between bonds. The 1986 tax change allows for the interest income exemption as well as the retention of the carrying cost deduction on municipal bonds purchased by commercial banks prior to August 8, 1986. Therefore, if the market segmentation theory predominates over the excess funds theory, one should observe a strong stockpiling effect shortly before the effective tax date. Such tax-driven stockpiling would lower the yield on tax-exempt bonds, thus increasing the yield spread between the similarly matched tax-exempt and taxable issues.[1] A reversal of this effect would occur after the tax changes become effective.

The particular yield spread to be examined is that between municipal and non-municipal issues, matched by similar grade and maturity or duration. The yields from eight highest grade municipal bonds as well as eight similar Treasures are obtained from the *Wall Street Journal (WSJ)* over the period July 1, 1986 through September 29, 1986.[2] The average yield spreads are computed over 5, 10, 15, 20, and 25 trading day intervals before and after the effective date of August 8, 1986.

Shifts in the average yield spreads before versus after this fundamental tax change are examined through a matched pairs sampling design. Since the distribution of the paired differences is unknown and the sample size is limited, the nonparametric Wilcoxon test statistic is used to compare the time average yield spreads.

EMPIRICAL RESULTS

Portfolio Analysis

The bond portfolio results are presented in Tables 1 through 4. Tables 1 through 3 have banks grouped into portfolios based on size (total assets) for year-end 1985. The first portfolio of banks is comprised of the largest banks and the smallest banks are contained in the 25th portfolio. Tables 4 through 6 contain 25 equally sized portfolios based on the actual tax rate from the 1985 data. (Income taxes paid to income before taxes and extraordinary items). The first portfolio contains those banks with the lowest tax rates and the last portfolio contains those banks with the highest tax rates. All portfolios contain the same number of observations (approximately 530) except for missing data.

Table 1 and Table 4 present results for the proportion of total state and local government securities to total securities. Not all securities issued by state and local governments are tax exempt securities. Unfortunately, the FDIC call and income reports do not differentiate between taxable and tax-exempt state and local securities until 1987. It is assumed in the analysis that the proportion of taxable state and local securities is negligible. This appears to be a reasonable assumption as evidenced by the data reported in Table 7. That table reports the proportion of tax exempt to total securities issued by state and local governments for years 1987 and 1988. As

seen, that proportion is in excess of 91 percent for all sized portfolios and appears to have declined slightly in 1988.

As might be expected, Table 1 indicates that the smallest banks have the smallest proportion of state and local securities and the larger banks had the larger proportion of state and local securities to total securities. Table 1 also shows a strong decline in this proportion for all size portfolios of banks after 1986. For all banks, the proportion of state and local securities to total securities drops from 25 percent in 1986 to slightly over 17% by 1988. Every portfolio indicates a decline between 1985 and 1986, between 1986 and 1987, and between 1987 and 1988. While not shown in the table, over 72 percent of all commercial banks reduced their holdings of state and local securities relative total securities between the years 1985 and 1988.

Similar results are obtained across portfolios sorted by the ratio of taxes paid to income as seen in Table 4. Again there is a decline in the proportion of state and local securities to total securities across each portfolio over the same time period 1985 1988. As might be expected, banks with the lowest tax rates tend to have the highest proportion of tax-exempt to total securities. This relationship is not monotonic but does seem to indicate high use of tax-exempt bonds for reducing income tax liabilities.

Tables 2 and 5 report the proportion of total securities to total assets for the same portfolios described above. As would be expected from Table 1, the portfolios containing the larger banks tend to hold much smaller amounts of securities to total assets. Surprisingly, this proportion stayed constant through 1986 and then rose in both 1987 and 1988. Every size based portfolio shows an increase between 1986 and 1987 and almost all show an increase between 1987 and 1988. These increases are quite small, however. The same results are obtained across portfolios sorted by tax rate. Thus the decrease in tax benefits does not appear to affect the overall bond portfolio but does fundamentally change the components of the portfolio.

Tables 3 and 6 provide the proportion of leasing receivables to total loans and leases. With the exception of the largest portfolio of banks the proportion of leasing activity is negligible. As seen in both tables, no significant changes in leasing activities are evident in any of the portfolios. Thus, it does not appear that the tax shield associated with leasing activities has been substituted to any degree for the tax shield associated with municipal bonds.

Because the proportion of total securities to total assets was rising in the two years immediately after the tax law change, it is not clear that the decline in the ratio of state and local securities to total securities over the same period implies a decline in dollar value of tax-exempt bond holdings by banks after the tax law change. Table 7 reports the proportion of banks in size based portfolios reducing actual dollar holdings (book-value) of tax-exempt bond holdings between the years 1987 and 1988. As seen, at least 50 percent of banks in the largest 21 portfolios show a decline in tax-exempt bond holdings. The very smallest banks on the other hand do not appear to have reduced their tax exempt holdings. It appears that the smallest banks have different motivations for holding tax-exempt bonds than do the larger banks.

Bond Yield Analysis

A tax-driven effect is examined through a matched pairs sampling design. The nonparametric Wilcoxon test statistic is employed to compare the differences in the average yield spreads before and after the Tax Reform Act of 1986. These differences were compared over 5, 10, 15, 20, and 25 trading day intervals. The null hypothesis is that there is no difference in the average yield spreads over time.

The spread was defined as the difference in yields between a tax-exempt and Treasury security of similar maturity (or duration in the cases where maturity could not be exactly matched). The time average of this spread was calculated for the trading day intervals. Because we have defined the spread as the tax-exempt less the taxable, the spread is negative. If segmentation exists, we would expect differences in the before and after spreads to be negative (a large negative spread minus a now smaller negative spread). For stockpiling to be observed we would expect to see the difference in the spreads in intervals before the tax law change be positive as bidders might drive down the tax-exempt yield immediately before the tax change went into effect to capture the grandfathering clause in the law.

Empirical results of this nonparametric test are presented in Table 7. The results show an insignificant difference in the average yield spreads of the five trading day and ten trading day intervals immediately before the tax change went into effect. However, comparisons of the longer trading day intervals indicate differences which are significant at the five percent level. The stockpiling effect was examined by comparing the five day interval

25-20 days before the tax change to the five day period immediately before the tax change. The test statistic, while significant, is of the incorrect sign. The identical test statistics in Table 7 were attributable to the extremely small sample size which renders repeatedly similar rankings.

CONCLUSIONS

The purpose of this study is to provide some evidence of the motives for bank participation in the municipal bond market. The market segmentation view suggests that tax preferences for banks have effectively segmented this market so that changes in tax preferences would have lasting effects on bond yields and bank portfolios. The "excess flow" view, on the other hand, suggests that banks purchase bonds only when they have excess funds due to decreased loan demand. With this view, the tax law change would be expected to have little impact on bank portfolios.

The results of this study provide mixed evidence toward either view. The yield analysis indicates little difference between yield spreads on Treasuries versus municipals in the short time period before and after the date the 1986 tax law change became effective. There are significant differences in the longer periods before the date against those afterward. There is no evidence of a stockpiling effect in the short period immediately before the tax change went into effect.

The portfolio analysis indicates dramatic declines in the proportion of state and local bonds held in bond portfolios by banks in the year immediately following the tax law change. This is not, however, accompanied by a decrease in the proportion of total assets held as bonds. Nor is an increase in leasing activity found after the tax law change. The results are thus suggestive of an "excess funds" view of bank bond portfolios. Banks do, however, appear to take relative yields into account with the excess funds that are invested.

TABLE 1

The Proportion Of State And Local Securities To Total Securities For Selected Years For Portfolios Of Commercial Banks. Portfolios Sorted On The Basis Of Descending Total Assets

	Year				
Portfolio	**1984**	**1985**	**1986**	**1987**	**1988**
1	.339	.389	.317	.257	.216
2	.358	.403	.364	.301	.248
3	.364	.404	.357	.305	.248
4	.342	.382	.344	.271	.222
5	.350	.368	.322	.261	.216
6	.367	.395	.349	.270	.220
7	.332	.370	.321	.266	.222
8	.320	.332	.279	.226	.204
9	.316	.341	.299	.240	.217
10	.308	.326	.282	.227	.193
11	.313	.333	.282	.225	.187
12	.277	.305	.269	.224	.193
13	.278	.308	.262	.210	.185
14	.262	.273	.244	.196	.173
15	.255	.270	.243	.206	.175
16	.242	.247	.220	.182	.156
17	.247	.252	.217	.181	.163
18	.229	.232	.215	.181	.159
19	.221	.222	.193	.161	.144
20	.201	.198	.183	.155	.135
21	.191	.185	.157	.134	.129
22	.191	.172	.144	.129	.118
23	.149	.144	.131	.117	.113
24	.135	.125	.110	.092	.082
25	.107	.102	.095	.079	.072
ALL BANKS	**.267**	**.280**	**.246**	**.202**	**.173**

TABLE 2

The Proportion Of Total Securities To Total Assets For Selected Years For Portfolios Of Commercial Banks. Portfolios Sorted On The Basis Of Descending Total Assets.

	Year				
Portfolio	**1984**	**1985**	**1986**	**1987**	**1988**
1	.178	.180	.176	.180	.175
2	.232	.227	.216	.220	.221
3	.250	.247	.240	.241	.247
4	.271	.267	.259	.266	.270
5	.271	.266	.265	.277	.288
6	.284	.284	.279	.290	.292
7	.286	.282	.277	.290	.301
8	.290	.287	.290	.303	.306
9	.290	.285	.282	.298	.306
10	.298	.293	.291	.312	.322
11	.291	.289	.292	.309	.318
12	.305	.299	.300	.319	.323
13	.275	.273	.273	.291	.297
14	.288	.279	.284	.302	.308
15	.294	.290	.292	.305	.311
16	.277	.271	.279	.299	.305
17	.288	.285	.286	.311	.316
18	.289	.281	.278	.301	.305
19	.287	.281	.289	.309	.311
20	.293	.280	.285	.308	.318
21	.287	.277	.285	.311	.315
22	.275	.271	.274	.302	.308
23	.284	.273	.278	.303	.303
24	.285	.263	.264	.286	.286
25	.289	.264	.262	.289	.295
ALL BANKS	**.278**	**.272**	**.272**	**.289**	**.294**

TABLE 3

The Proportion Of Leasing Receivables To Total Loans And Leases For Selected Years For Portfolios Of Commercial Banks. Portfolios Sorted On The Basis Of Descending Total Assets.

	Year				
Portfolio	**1984**	**1985**	**1986**	**1987**	**1988**
1	.012	.013	.013	.014	.014
2	.006	.006	.006	.005	.005
3	.003	.004	.003	.004	.003
4	.004	.004	.004	.003	.002
5	.003	.003	.003	.003	.002
6	.003	.004	.004	.004	.004
7	.003	.003	.003	.003	.002
8	.002	.001	.001	.001	.001
9	.002	.002	.002	.002	.002
10	.003	.003	.003	.003	.003
11	.001	.001	.002	.003	.002
12	.001	.001	.001	.001	.001
13	.002	.002	.002	.002	.001
14	.001	.002	.001	.002	.002
15	.001	.001	.001	.001	.001
16	.001	.001	.001	.002	.002
17	.002	.002	.001	.001	.001
18	.001	.001	.001	.001	.001
19	.001	.001	.001	.002	.002
20	.001	.001	.001	.001	.001
21	.001	.002	.002	.003	.003
22	.001	.000	.001	.001	.002
23	.001	.001	.001	.001	.001
24	.001	.001	.001	.001	.000
25	.001	.001	.001	.001	.001
ALL BANKS	**.002**	**.002**	**.002**	**.003**	**.002**

TABLE 4

The Proportion Of State And Local Securities For Selected Years For Portfolios Of Commercial Banks. Portfolios Sorted On The Basis Of Ascending Tax Rate.

	Year				
Portfolio	**1984**	**1985**	**1986**	**1987**	**1988**
1	.384	.371	.291	.212	.173
2	.364	.363	.312	.252	.203
3	.204	.168	.127	.107	.099
4	.173	.135	.107	.094	.079
5	.198	.154	.131	.103	.083
6	.244	.211	.170	.149	.124
7	.349	.360	.308	.250	.217
8	.335	.358	.312	.256	.226
9	.317	.348	.307	.259	.228
10	.314	.354	.314	.266	.230
11	.307	.353	.312	.256	.215
12	.306	.350	.314	.260	.230
13	.292	.328	.286	.234	.204
14	.297	.340	.303	.251	.221
15	.282	.317	.278	.238	.206
16	.259	.297	.274	.238	.200
17	.270	.301	.264	.219	.194
18	.258	.304	.274	.229	.195
19	.248	.280	.254	.206	.168
20	.215	.257	.238	.189	.160
21	.205	.225	.214	.168	.141
22	.189	.219	.200	.162	.136
23	.162	.181	.178	.144	.117
24	.125	.130	.133	.117	.095
25	.330	.294	.227	.161	.138
ALL BANKS	**.267**	**.280**	**.246**	**.202**	**.173**

TABLE 5

The Proportion Of Total Securities To Total Assets For Selected Years For Portfolios Of Commercial Banks. Portfolios Sorted On The Basis Of Ascending Tax Rate.

	Year				
Portfolio	**1984**	**1985**	**1986**	**1987**	**1988**
1	.275	.274	.284	.312	.323
2	.272	.266	.268	.280	.287
3	.257	.235	.239	.259	.254
4	.239	.229	.240	.268	.278
5	.180	.157	.152	.192	.223
6	.196	.173	.175	.203	.213
7	.321	.322	.326	.340	.340
8	.308	.307	.307	.318	.314
9	.314	.312	.307	.317	.315
10	.310	.308	.302	.310	.309
11	.311	.309	.308	.321	.324
12	.311	.308	.301	.309	.302
13	.318	.320	.315	.321	.317
14	.310	.307	.299	.308	.312
15	.297	.296	.291	.300	.302
16	.310	.310	.304	.311	.306
17	.299	.294	.290	.299	.305
18	.288	.283	.278	.292	.294
19	.281	.278	.274	.279	.285
20	.280	.273	.274	.289	.293
21	.286	.284	.279	.298	.298
22	.284	.278	.273	.292	.299
23	.261	.250	.242	.260	.272
24	.201	.192	.201	.228	.248
25	.236	.241	.259	.294	.309
ALL BANKS	**.278**	**.272**	**.272**	**.289**	**.294**

TABLE 6

The Proportion Of Leasing Receivables To Total Loans And Leases For Selected Years For Portfolios Of Commercial Banks. Portfolios Sorted On The Basis Of Ascending Tax Rate.

	Year				
Portfolio	**1984**	**1985**	**1986**	**1987**	**1988**
1	.003	.004	.003	.004	.004
2	.004	.004	.004	.004	.003
3	.001	.001	.001	.002	.002
4	.001	.001	.001	.001	.001
5	.001	.000	.000	.000	.000
6	.003	.003	.003	.002	.002
7	.002	.003	.002	.003	.004
8	.001	.003	.002	.002	.002
9	.003	.004	.003	.004	.004
10	.002	.002	.002	.002	.002
11	.004	.004	.004	.004	.003
12	.003	.003	.003	.003	.002
13	.002	.003	.004	.003	.003
14	.002	.002	.002	.003	.003
15	.003	.004	.003	.003	.004
16	.002	.002	.002	.003	.003
17	.002	.002	.002	.002	.002
18	.002	.002	.002	.002	.002
19	.002	.002	.002	.002	.002
20	.002	.002	.003	.003	.002
21	.002	.003	.002	.002	.002
22	.004	.002	.001	.002	.002
23	.002	.001	.002	.002	.005
24	.001	.001	.001	.002	.002
25	.003	.002	.003	.003	.002
ALL BANKS	**.002**	**.002**	**.002**	**.003**	**.002**

TABLE 7

Tax-Exempt Securities To Total State And Local Government Securities For Selected Years And Proportion Of Banks Reducing Municipal Bond Holdings Between 1987 And 1988. Portfolios Sorted On The Basis Of Descending Total Assets.

Portfolio	Tax-Exempt To Total State And Local Government Securities		Proportion Decreasing Tax-Exempt Security Holdings
	1987	1988	1987-1988
1	.988	.981	.680
2	.976	.978	.673
3	.981	.967	.695
4	.976	.964	.734
5	.959	.947	.703
6	.959	.947	.673
7	.969	.945	.704
8	.954	.942	.656
9	.961	.948	.675
10	.964	.948	.661
11	.959	.942	.704
12	.964	.952	.638
13	.946	.935	.639
14	.954	.939	.619
15	.962	.948	.613
16	.960	.927	.604
17	.958	.933	.586
18	.939	.926	.561
19	.949	.931	.563
20	.941	.922	.554
21	.948	.932	.536
22	.938	.929	.482
23	.934	.900	.423
24	.927	.895	.439
25	.913	.900	.312
ALL BANKS	**.956**	**.941**	**.600**

TABLE 8

Non Parametric Tests Of Bond Yield Differences Before And After The Tax Reform Act of 1986

Time Period Comparisons (In Trading Days)[a]	Wilcoxon Test Statistic[b]
5B versus 5A	-.28
10B versus 10A	-1.26
15B versus 15A	-2.52*
20B versus 20A	-2.52*
25B versus 25A	-2.52*
25-20B versus 5B	-1.82**
5B versus 20-25A	-2.52*
25-20B versus 20-25A	-2.52*

*Significant at the five percent level.

**Significant at the ten percent level.

a. 5B denotes the 5 day trading period immediately before the tax law change went into effect. 5A denotes the 5 day trading period immediately after the tax law change went into effect.

b. The coincidence of identical test statistics is attributable to the extremely small sample size which renders repeatedly similar rankings. The parametric t-test yielded the same conclusions.

ENDNOTES

1. One problem with measuring such an effect is that banks know of the upcoming tax law change well in advance of the August 7, 1986 date the change became effective. Stockpiling could have been very gradual and not measured by our test.

2. The sample size is limited by the small number of municipals listed in the *WSJ* which trade continuously over the test period.

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