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Information, Capital Gains Taxes & New York Stock Exchange

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INFORMATION, CAPITAL GAINS TAXES & NEW YORK STOCK EXCHANGE

by

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Abstract

We present evidence regarding the response of stock prices in the New York Stock Exchange to news about capital gains taxes. If information about an upcoming event becomes available, then it should be reflected in prices as soon as the news about it arrives. In the 1980 – 2003 period there are 2383 newspapers articles that address upcoming changes in capital gains taxes. From these articles, we construct two indicator functions to represent information. One that corresponds to news about the upcoming decreases in taxes and the other increases in taxes. Our results indicate that information regarding the event is significant in explaining firm returns.

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1 Introduction

Stock markets are the pulses of economies around the world. They reflect every action taken by the economic and political agents. Expectations are purchased and sold and therefore represent agents' beliefs about the economy. Information is integrated in stock prices and volume. The credibility of the information is assumed to affect movements in the stock market. A change in the price, volatility, or volume in the market due to the related information flow implies that the content of the information is taken for granted. Therefore, information that is not credible can easily be discarded from the portfolio of information. This highlights the crucial importance of identifying the correct information that is going to be incorporated in the prices in order to extract the exact effects.

In this study, we present evidence regarding the response of stock prices to the information of capital gains tax: the tax that is levied on the income which is obtained through an increase in the value of the portfolio that investors are holding. We believe that this information alters investor behavior.

In the past twenty three years, eight major stock market movements can be attributed to the information of capital gains tax changes. The two major tax reforms; the tax reform of 1981 and 1986, changed the corporate taxation. In addition, the stock market crash (Black Monday) on October 19, 1987, was mainly due to the unexpected increase in the budget deficit and changing expectations towards recession.[2] In February 1993, the president's address regarding the increase in the taxes on businesses and middle income families led to a decline in stock markets. In November 1994, the Dow Jones boomed as a result of the consensus between the Democrats and the Republicans which was expected to lower taxes, decrease federal spending and lower budget

[2] High defense spending and low tax revenues under the Regan administration resulted in high budget deficits. Regan administration was reluctant to increase the taxes to finance the deficit which means

deficits. In March 1996, the Dow Jones crashed as a result of the inability of Congress to pass a tax cut. In July 1997, the capital gains top rate was again decreased to 20 percent from its 28 percent level, and 30 percent of gains were excluded from taxes[3]. In January 2001, capital gains taxes on long term gains were lowered to 18 percent from its 20 percent level, but this was only applied to purchases of assets after the change had taken place. Investors could sell their stock, pay capital gains taxes, and repurchase their stocks at the same price. And, if they decided to hold on to the same stocks for 5 years, they could benefit from lower taxes. The last change in taxation occurred in May 2003 when capital gains taxes were again reduced to the 15 percent level under the Republican administration.

We proxy the tax information through newspaper articles that are related to capital gains taxes. We employ the methodology to a random draw of 100 firms among a pool of 2800 firms in the NYSE over the 1980 – 2003 period. Results suggest that there is a significant relationship between the information and the return. However, industry specific regressions do not present the same evidence, except in finance, insurance and real estate industries.

The structure of the paper is as follows: in the proceeding section we discuss the literature and provide some insight into the approach of the study. In this respect, we outline the main motivation. In Section 3, we discuss the data used and the methodology. In section 4, estimation results are presented. Finally, section 5 concludes.

2 Motivation and Literature

In financial markets, expectations play an important role in market participants' actions. These expectations are incorporated into prices after the determination of investment strategies.

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increase need to finance the deficit by the Treasury through borrowing, which will increase the interest rates and put the economy in a recession.

In studies dating back to mid-1970s, assorted variables were used to measure the expectations. Market volume was suggested to be one of the proxies that incorporate expectations to the stock market (Morgan, 1976). This was further justified by Lamoureoux and Lastrapes (1994) when they proposed that market volume is a good measure to represent the daily information flow to the stock market. Their results indicate the significance of daily information flow in explaining the changes in volatility. Later, this result was extended by Salman (2002) in return equations. In an emerging market setting, Salman (2002) found that market volume is also significant in explaining both return and risk in emerging stock markets.

There is vast amount of literature about taxes and their impact on the stock market. Dyl (1977), Sims (1995) and Poterba and Weisbenner (1998) examine loss-motivated selling that occurs at the end of the calendar year. This motive is mainly due to differential treatment that the government exhibits towards long and short-term capital gains (high taxes are paid for short-term holdings of securities). Capital gains tax may also result in a loss for high-income investors as a result of the lock-in affect. It is calculated that this loss may increase up to 1.5 percent of the total gains (Yitzhaki, 1979). Considering the volume of gains, this aggregates to a significant portion of investors' income. Moreover, investors' response to temporary and permanent changes in capital gains taxes will be different in realizing their gains. In some cases, time – series studies do not find evidence of responsiveness in capital gains as a result of changes in taxes. Timing in deciding when to realize the gains turns out to be significant in these studies. Stiglitz (1983) argues that by accelerating losses and deferring gains, hedging and borrowing can be used to avoid taxes as long as there are no capital market imperfections. Investors can prolong the process until their death to avoid taxes; however, the size of the capital gains is so large that this argument

[3] In this respect, maximum long-term capital gains tax in the 15 percent bracket level set to be 10 percent (Mitrusi and Poterba, 1999).

does not hold empirically. Constantinides (1984) argued that as soon as the capital gains are qualified for long – term tax rates, then realization of these gains are optimal.

Investors do respond to incentives and alter their behavior with capital gains taxes; therefore, it is natural to expect that they will respond to tax changes. The question is when should this response happen? Will investors wait until the enactment of the tax law, or will they react as soon as they have realized that a change is going to take place. Let us assume a situation where the government is debating lowering capital gains taxes. Should we expect the investors to wait until after the taxes have been reduced? If so, there will be more securities for sale in the market, which will reduce the price and thus the return. So, it is expected that some investors will react earlier than the tax lag change to avoid losses due to price changes. However, since every investor behaves in this manner, the actual purchase and sale should be realized as soon as the information arrives in the market. It is natural to expect that the Congressional discussions on capital gains tax can be taken as indications of future tax cuts or raises. Therefore, investors may use this particular information and integrate it to their expectations, and consequently alter market return.

One attempt to test this effect was conducted by Cutler (1988). He was interested in identifying the impact of voting by the House of Representatives and Senate Finance Committee on the excess returns for Fortune 500 firms. He identified these dates, observed the changes in the excess return in these dates, and studied the correlation between the excess returns on days containing similar news in the overall market. However, Cutler (1988) finds mixed evidence of market reaction to the tax information. He concludes that *"…observed reaction may be inefficient pricing of the tax news by the market."* He also points out the difficulty in concluding that tax news has an effect on the stock market return.

Our starting point is that rational investors will respond to credible information as soon as they receive it. In this respect, if investors believe that there will be tax changes in the future then these expectations will be purchased before the implementation of these changes. This allows us to re-formulate Cutler's question. If there will be changes in excess return due to an implementation of capital gains taxes, should we not look for an earlier date than the voting dates? When the information with respect to tax reforms is already in the market, we should observe that this information is already incorporated into the price on the first dates that investors find it credible.

There is a significant amount of research on the impact of announcements on macroeconomic variables dating back to Dornbucsh (1980) and Frenkel (1981). They find evidence with regard to the predictive power of information about macroeconomic fundamentals on exchange rates. Fornari, Monticelli, Pericoli and Tivegna (2002) use the headlines from the Financial Times as the information about macroeconomic variables to explain exchange rate behavior. Jo and Willett (2000) differentiate between good and bad news during the East Asian crisis. Fisman (2001) uses the information with respect to President Suarto's health to identify some portion of the value of a firm in Indonesia. His results indicate that the implied value is so high that it can be accounted for by political connection. Finally, Kauffman and Weerapana (2003) study the AIDS-Related News and the exchange rate movements in South Africa. They postulate that bad news has a significant impact on the value of the South African currency, whereas positive news has a minimal effect.

Our methodology in constructing the indicator function deviates from the literature in the following direction; we investigate the content of news, not just the headlines since investors do react to news. We do not miss any information that is not in the headline; therefore, we will investigate the information within the article in the process of identification.

3 Data and Methodology

Our estimation strategy involves 3 steps. The first step is the construction of two indicator functions. These measures indicate information about upcoming capital gains tax increases and decreases, which we denote by I^+ and I^-. For each day, we simply count the number of newspaper articles on the issue.

We have found 2383 newspapers articles whose body contain words "capital gains taxes," "senate," "increase," "decrease" during the period. These articles are obtained from *LexisNexis Academic* which appeared in major newspapers in the Washington D.C. and New York area including Washington Post, Washington Times, and New York Times. Details of the newspaper articles are presented on Table (3.1). A majority of articles appeared in the New York Times, Washington Post and Washington Times. Out of total 2383 articles, 743 are regarding increases in capital gains taxes and the other 1640 articles are regarding decreases in taxes.

Our second step regression is the market model along with the indicator functions and the firm specific volumes as control variable. This model is presented in Equation (1). We begin our estimations with the following restrictions; we set $i = 1$, and $\gamma_1 = 0$, $\gamma_2 = 0$ and $\gamma_3 = 0$. therefore estimating (3.1) for each firm.

$$R_{it} = \sum_{i=1}^{I} D_i + \sum_{i=1}^{I} \beta_i D_i R_{mt} + \gamma_1 I_{t-s}^{-} + \gamma_2 I_{t-s}^{+} + \gamma_3 V_{it-v} + u_{it} \tag{1}$$

In this equation for $i=1,\ldots,I$, R_{it} is the return for firm i that includes all dividend payments associated with the security, and therefore represents the total return for holding that stock in the portfolio on a daily basis, R_{mt} is the market return, β_i is the portion of the stock which cannot be diversifiable for firm i[4], and u_{it} is the excess return for firm i. We allow s and v to be integers. We

[4] A quantitative measure of the volatility of stock "i" relative to the overall market. This coefficient is also used for mutual funds and portfolios. $\beta_i = cov(R_i,R_m)/var(R_m)$

use daily data[5] for 100 firms which are randomly sampled from 2800 firms that are listed in the New York Stock Exchange (NYSE) for the period of January 1, 1980 – December 31, 2003. The data is obtained from The Center for Research in Security Prices (CRSP®)[6]. Our random sample is a good representation of the stock market. We have firms in each division of the Standard Industry Classification (SIC). The details of the industry classification of the data are given in Table (2). Sixty firms in the sample are from Manufacturing, Finance, Insurance and Real Estate sectors that corresponds to divisions D and F. 19 of the firms are from the Transportation, Communication, Electric Gas and Sanitation Services. For R_m, we use the composite return for NYSE which we obtain from the NYSE website.[7] The majority of our firms' return move less than the market: 78 percent of the firms in our sample have β's that are less than one. The average β is 0.7 (Figure 1); therefore, if we are to find an effect of news on return, it will be a conservative one.

Note that the estimate of β in Equation (1) may contain a bias due to omitted variables in the initial stage. The information that is not included in the regression will appear in the error term; therefore, market return will not be orthogonal to the errors. Our belief is that information about capital gains taxes are variables that matter in determining the return. Therefore, in the second step we introduce capital gains tax information into the regressions by removing the restriction of $\gamma_1 = 0$ and $\gamma_2 = 0$. We should expect that if there is credible information with respect to capital gains taxes, this will be reflected in significant coefficients. Our belief is that γ_1 is negative based on the following intuition. Information about a capital gains tax cut motivates the investor to hold onto their portfolio until the change takes place. If investors receive information that capital gains taxes will be reduced in the future, they will be more reluctant to realize their

[5] Excluding weekends and holidays
[6] This database is at Wharton School, University of Pennsylvania.
[7] www.nyse.com

gains; rather, they will postpone it to after tax reform period. Let us call this the patience motive. This motive should be negatively related to the return. However, short – term trading investors will also inherit a purchase motive with lower capital gains taxes. Moreover, new investors will be willing to buy the security, driving up the price and reducing the return. Let us call this the trading motive. These two motives work in the same direction. We can use the same argument for the expected increase in capital gains taxes. In that situation, the directions for the two effects will be opposite.

To control for firm specific effects we use the dummy variables D_i. These dummies take the value one for the firm i and zero for firm j where $i \neq j$. The use of dummies will allow us to obtain a firm specific β, and at the same time control for the information that the market is responding as a whole. However, we will still suffer from omitted variable bias if we have additional determinants of return. One should control for information with respect to firms' financial standing, expected future returns and relative pricing effects[8] (Cutler, 1988). Unbiased coefficient estimates can only be obtained if we can proxy this information. Morgan (1976) and Lamoureoux and Lastrapes (1990) suggest that a firm's volume will serve as a good candidate for this information.

The third step of our estimation involves removing the restriction $\gamma_3 = 0$. We represent market volume with V_{it} , that is the number of trades with respect to firm i at time t. Lamoureoux and Lastrapes (1990) argue that $\gamma_3>0$. Nevertheless, their estimation results indicate a significant and positive coefficient for volume.

[8] Firm's financial standing can be a function of "book value of firm's capital", "growth rate of firm's inventories", "net book value" etc.

4 Estimation Results

We begin our estimation with contemporaneous variables and exclusion of the control variable V_{it}. The results are presented in the first column of Table 3. As expected, the information about upcoming reductions in capital gains taxes is negative and significant at the ten percent level. Contrary to what we suggested above, the information about upcoming increases in taxes is also negatively related, however insignificant.

Columns 2 through 5 display results with control variables. The inclusion of control variables improves the precision of our Γ estimate; however, we still get insignificant and negative coefficients. The coefficient of the Γ estimate ranges from -0.000121 to -0.000199; these are fairly small numbers. Although they are statistically significant, it seems that they are insignificant economically. In order to compare the impact of this coefficient, we calculate the average daily return for our firms. During the sample period, our 100 firms realized a daily return of 0.0739 percent on average. The coefficient estimates account for 15 – 20 percent of the average daily return; this is a also an economically significant result. This result indicates that if there is information about capital gains taxes, investors price this information.

One can argue that the news in newspapers appears a day later than the actual impact of the information. Newspapers often publish news from the previous day, and of course, news about upcoming events. In order to see the impact of the previous day's information, we forward our indicator variables by one period. The results are on Table (4). One implication of forwarding is reflected in the size of the coefficient. Although the signs of the coefficients have not changed in magnitude, on average they are less than the ones in the contemporaneous functions. However, there is significant improvement in precision. Furthermore, in two of the five cases, we obtain the right sign with the Γ^{+} dummy, however still insignificant.

Table 5 reports the results with lag of indicator functions; however, they are not as promising as the first two timings. This is not surprising since the lag of indicator function is old news, and that information is already in the prices.

In order to further investigate the impact of tax information, we look for industry specific returns. One might believe that gains in some industries are higher than in other ones. Therefore, investors may reflect their expectations in returns in specific industries rather than in the overall stock market. In Table (6) we present the industry regression results. As suggested by previous regressions, we only used forward indicator functions, and as a control variable, the natural logarithm of the contemporaneous volume.[9] A striking result of this Table is the insignificance of I^- indicator in industry basis. Another one is that I^+ is significant and has the correct sign in the Division E of SIC.

5 Conclusion

We examined the effects of tax information on the stock market. Our approach is unique because of the way that information enters into the return equation. We incorporate information as the number of articles published about capital gains taxes in major newspapers. We defined two measures of information. The first is a measure of information about the increases and decreases in capital gains taxes. It is a frequency variable that calculates the number of articles that mentions capital gains taxes. The second is the firm's volume that controls for information flow. Our results indicate that investors respond to news regarding the reduction in capital gains taxes, and some part of this response is also seen in response to categorization of industries.

[9] We performed estimation with all combinations that are addressed in Table's 3.3 – 3.6, however instruments other than the contemporaneous values of volume and indicator functions other than the forward ones do not do well.

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Figure 1
Beta's (β_i)

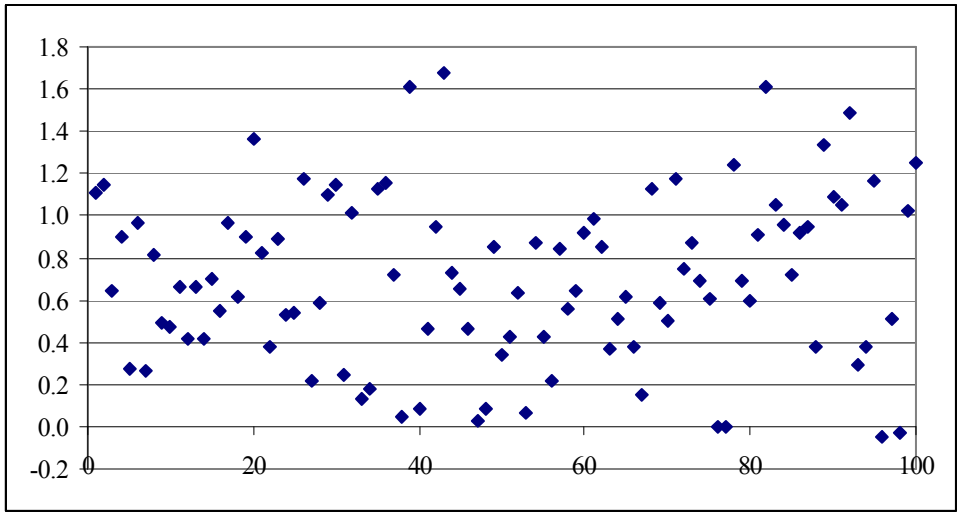

Table 1
Newspapers and Number of Articles

New York Newspapers	***Number of Articles***		
	Total	*Increase*	*Decrease*
Associated Press	15	0	15
Bloomberg Radio News	2	0	2
BRIDGE NEWS	2	0	2
Buffalo News (New York)	41	5	36
Crain's New York Business	14	5	9
Daily News	9	0	9
New York Law Journal	9	1	8
New York Observer	1	0	1
The New York Post	8	0	8
The New York Sun	7	0	7
The New York Times	731	266	465
The Post-Standard	31	19	12
The Times Union	57	0	57
NY Total	*927*	296	631

Washington D.C. Newspapers	***Number of Articles***		
	Total	*Increase*	*Decrease*
Cox News	28	0	28
Roll Call	70	22	48
States News Service	99	43	56
The Hill	23	0	23
Washington Post	697	251	446
Washington Times	534	131	403
Washingtonian	5	0	5
DC Total	*1456*	447	1009

TOTAL	**2383**

Table 2
Major Industry Groups
Standard Industry Classification (SIC)

B. Mining
12: Coal Mining
13: Oil and Gas Extraction
C. Construction
15: Building Construction General Contractors and Operative Builders
4 FIRMS

D. Manufacturing
20: Food and Kindred Products
26: Paper and Allied Products
27: Printing, Publishing, and Allied Industries
28: Chemicals and Allied Products
30: Rubber and Miscellaneous Plastics Products
33: Primary Metal Industries
34: Fabricated Metal Products, Except Machinery and Transportation Equipment
35: Industrial and Commercial Machinery and Computer Equipment
36: Electronic and Other Electrical Equipment and Components, Except Computer *Equipment*
37: Transportation Equipment
38: Measuring, Analyzing, and Controlling Instruments; Photographic, Medical
28 FIRMS

E. Transportation
44: Water Transportation
45: Transportation by Air
48: Communications
49: Electric, Gas, And Sanitary Services
19 FIRMS

F. Wholesale Trade
50: Wholesale Trade-durable Goods
51: Wholesale Trade-non-durable Goods
G. Retail Trade
53: General Merchandise Stores
55: Automotive Dealers and Gasoline Service Stations
59: Miscellaneous Retail
7 FIRMS

H. Finance, Insurance, and Real Estate
60: Depository Institutions
62: Security and Commodity Brokers, Dealers, Exchanges, and Services
63: Insurance Carriers
67: Holding and Other Investment Offices
32 FIRMS

I. Services
73: Business Services
79: Amusement and Recreation Services
83: Social Services
10 FIRMS

Source: US Department of Labor

Table 3
Regressions with I_t

	1	2	3	4	5
γ_1	-0.0001286	-.000121	-.0001524	-0.000199	-0.000145
	[a](0.0000794)	(.0000799)	(.0000792)	(8.03E-05)	(7.97E-05)
	[b] *0.105*	*0.130*	*0.054*	*0.01*	*0.069*
γ_2	-0.0001096	-.0002397	-2.63e-06	-0.000111	-1.09E-05
	(0.0001147)	(.0001124)	(.000113)	(0.000112)	(0.000113)
	0.339	*0.033*	*0.981*	*0.33*	*0.923*
V_t		-1.86e-10			
		(8.94e-11)			
		0.038			
V_{t-1}			-3.15e-11		
			(5.88e-11)		
			0.592		
lnV_t				0.0006243	
				(4.15E-05)	
				0.00	
lnV_{t-1}					-0.000063
					(3.98E-05)
					0.114
R^2	0.0796	0.0867	0.0865	0.0878	0.0865
T	316449	302903	302903	302920	302903

[a] Numbers in parenthesis are standard errors
[c] probabilities are represented with italic numbers

Table 4
Regressions with I_{t+1}

	1	2	3	4	5
γ_1	-.0001611	-.0001179	-.0001706	-.0002004	-.0001638
	[a](.0000673)	(.000068)	(.0000675)	(.0000682)	(.0000676)
	[b]*0.017*	*0.083*	*0.011*	*0.003*	*0.015*
γ_2	-.0000814	-.0001788	.000087	-.0000558	.0000787
	(.0001145)	(.0001139)	(.0001111)	(.0001139)	(.0001109)
	0.477	*0.116*	*0.433*	*0.624*	*0.478*
V_t		-1.85e-10			
		(8.94e-11)			
		0.039			
V_{t-1}			-3.08e-11		
			(5.87e-11)		
			0.600		
lnV_t				.0006266	
				(.0000414)	
				0.000	
lnV_{t-1}					-.0000603
					(.0000397)
					0.128
R^2	0.0796	0.0867	0.0865	0.0865	0.0878
T	316351	302823	302805	302805	302823

[a] Numbers in parenthesis are standard errors
[b] probabilities are represented with italic numbers

Table 5
Regressions with I_{t-1}

	1	2	3	4	5
γ_1	-.0001033	-.0000617	-.0001022	-.0001364	-.0000954
	[a](.0000776)	(.000077)	(.0000774)	(.0000777)	(.000078)
	[b]0.183	0.423	*0.187*	*0.079*	*0.221*
γ_2	9.55e-07	-.0001277	.0001311	1.69e-06	.0001223
	(.0001165)	(.0001159)	(.0001137)	(.0001158)	(.0001135)
	0.993	*0.271*	*0.249*	*0.988*	*0.281*
V_t		-1.85e-10			
		(8.94e-11)			
		0.039			
V_{t-1}			-3.07e-11		
			(5.88e-11)		
			0.601		
lnV_t				.0006245	
				(.0000415)	
				0.000	
lnV_{t-1}					-.0000621
					(.0000398)
					0.119
R^2	0.0796	0.0867	0.0865	0.0878	0.0865
T	316449	302920	.02554	302920	302903

[a] Numbers in parenthesis are standard errors
[b] Probabilities are represented with italic numbers

Table 6
Major Industry Group Regressions
(I_{t-1} as an explanatory variable)

	SIC<20	SIC∈[20,40)	SIC∈[40,50)	SIC∈[50,60)	SIC∈[60,70)	SIC ≥ 70
γ_1	-.0002744	-.0001347	-.0002103	-.0000701	-.0001914	-.0004725
	(.0004293)	(.0001199)	(.0001427)	(.0002989)	(.0000822)	(.0003548)
	0.523	*0.261*	*0.141*	*0.814*	*0.020*	*0.183*
γ_2	-.0015599	-.000044	.0003069	.0002543	-.0002504	-.0001379
	(.0014057)	(.0001733)	(.0001686)	(.0002948)	(.0002537)	(.0006925)
	0.267	*0.800*	*0.069*	*0.388*	*0.323*	*0.842*
lnV_t	.0010504	.0006404	.0005289	.000435	.0003706	0010751
	(.0002262)	(.0000719)	(.0000875)	(.0001635)	(.0000505)	(.0001161)
	0.000	*0.000*	*0.000*	*0.008*	*0.000*	*0.000*
R^2	0.0540	0.1028	0.0904	0.1048	0.1000	0.0556
T	10200	104160	53491	18358	88776	27838

[a] Numbers in parenthesis are standard errors
[b] probabilities are represented with italic numbers
SIC: Two Digit Standard Industry Classification