

# THE EFFECT ON STOCK PRICES OF THE SWEDISH WEALTH TAX

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## Abstract

The Swedish wealth tax on individuals imposes an interesting, and unusual, asymmetry on listed stocks. Stocks on the A list of the Stockholm Stock Exchange are subject to the wealth tax, whereas stocks on the O list are not (with some exceptions). This paper attempts to discern the valuation effect of this differential tax treatment. In the first place, it uses data relating to some 25 stocks that lost their wealth tax exemption in 1997, to see what that loss meant to stock prices. In the second place, it uses data from 2000 - 2003 to try to detect value differences between two sets of stocks that are subject to different wealth tax treatments. The wealth tax may result in value differences on the order of 5% to 10% on average in certain cases between otherwise comparable groups of stocks. However, the results in this paper are mostly not significant from a statistical point of view.

**Keywords:** Wealth tax, stock prices, book values, accounting earnings, value relevance, abnormal returns

**JEL classification codes:** H24, M41, G12

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# 1. Introduction

The Swedish wealth tax is imposed on individuals and estates pertaining to deceased individuals. The wealth tax rate is 1.5% of the tax base. With one unimportant exception, the wealth tax is not imposed on institutional investors.<sup>1</sup> In particular, Swedish corporations are exempt from that tax. It is an interesting aspect of the Swedish wealth tax that certain shares of stock do not enter into the tax base. More precisely, stocks that are listed on the Stockholm Stock Exchange O list are exempt from the wealth tax (with some exceptions). Stocks that are listed on the A list, on the other hand, are subject to the wealth tax. This is the situation today (November 2004). Before 1997, certain A-listed stocks were tax exempt as well. The relative disadvantage in question has no direct relation to firm characteristics. In other words, there is no difference in taxation on the firm level. The difference enters only on the investor level, in that certain stocks are more favorable after investor taxes for individuals. Hence, stocks on the A list should have a relative disadvantage from a valuation point of view. The purpose of this paper is to search the available evidence for some indication of the size of that disadvantage.

An interesting event that sheds light on the valuation effect of the Swedish wealth tax is a change in tax status in 1997 for 35 companies on the A list. More precisely, these companies lost their previous status as exempt from the wealth tax in that year. The effect of that change is studied with the use of stock market and accounting data relating to some 25 of these companies before and after the change in tax status. Stock market and accounting data pertaining to the years 2000 - 2003 are also used to see if stocks that are subject to the wealth tax have relatively lower market values than comparable stocks that are tax exempt. Perhaps due to the limited data sets (since the number of stocks on the Stockholm Stock Exchange is quite small), statistically significant results are generally not obtained. However, one finds at least traces of an advantage due to exemption from the wealth tax. For reasonably comparable stocks (meaning stocks of medium-sized companies), a relative value difference of the order of 5% to 10% is suggested.

The outline of this paper is as follows: The next section gives background information about the manner in which the Stockholm Stock Exchange is divided into different lists, and about the wealth tax. The next section also mentions some background data suggesting effects of the wealth tax. After that, Section 3 reports on the investigation of the change in tax status for certain stocks in 1997. The group of A-listed stocks that lost the tax exempt status is compared to a group of A-listed stocks that were never exempt. The methodology is to compute daily cumulated abnormal returns for two portfolios (corre-

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<sup>1</sup>The unimportant exception is the following: Under restrictive conditions, foundations and clubs can also be subject to the wealth tax. If so, the rate is 0.15%. The wealth tax on foundations and clubs is disregarded in what follows.

sponding to the two groups of stocks just mentioned) over a fairly long period. A simple regression model in the spirit of Warfield and Wild (1992) relating the return on a share of stock to accounting earnings, with a dummy variable for change in tax status, is also used. A regression model in the spirit of Ohlson (1995) that relates market value to book value and accounting earnings, with a dummy variable for tax status (and other dummy variables as well), is used in Section 4 on data from 2000 - 2003. Section 5 contains concluding remarks.

Effects of tax asymmetries between, e. g., categories of *investors* have been studied in a number of earlier contributions, for instance by Liljeblom, Löflund, and Hedvall (2001). The author is not aware of any earlier paper about effects of wealth tax asymmetries between different categories of *stocks*. In that respect, the present study seems novel.

## **2. A brief history of the Swedish wealth tax on stocks since 1990, and some suggestive background data**

The main stock lists on the Stockholm Stock Exchange are the A list and the O list. The A list has traditionally been intended for larger, more established companies, and the O list for smaller and younger ones. Consequently, the requirements for being quoted on the A list are somewhat more stringent than for the O list. For instance, a company on the A list must have a verifiable business history (in the form of accounting statements) covering at least three years. Also, such a company should have at least 2000 share owners. For the O list, it suffices with only 500 share owners. Earlier, there was also an OTC list for even smaller companies, but that list was merged with the O list in July 2000. There used to be a presumption that a successful listed company would eventually "graduate" from the O list to the A list. However, due to the wealth tax, this presumption no longer holds.

The A list is divided into the two segments "Most actively traded" and "Other". Inclusion in the Most actively traded segment is for six months each time and is based on turnover and total value criteria during a preceding measurement period of 12 months. Similarly, the O list is divided into the two segments "Attract 40" and "Other". Again, inclusion in the Attract 40 segment is for six months each time and is based on measured turnover during a previous six month period. The Attract 40 segment was created in July 2000 as a stamp of high interest among investors for companies that would perhaps otherwise (i. e., were it not for the wealth tax) have preferred to be on the A list.<sup>2</sup>

A wealth tax is fairly unusual. In addition to Sweden, among OECD countries only Finland, France, Iceland, Luxembourg, Norway, Switzerland, and Spain have such a tax

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<sup>2</sup>Information about the A and O lists is taken from the Stockholm Stock Exchange web site.

(Skatteverket 2003, p. 310). Since the early 1990's, the Swedish wealth tax rate has been 1.5% of the tax base. The wealth tax is applicable above a deductible amount. That deductible amount has been increased from 800,000 in 1992 to 900,000 in 1996, 1,500,000 in 2001 and 2,000,000 in 2002 (all amounts in SEK; on November 10 2004, 1 USD = 7.03 SEK, 1 EUR = 9.07 SEK). The reader is reminded that the wealth tax is applicable only to individuals, i. e., not to corporations or institutional investors. During the non-socialist government of the early 1990's, there was a decision that the wealth tax should be eliminated. However, the elimination was delayed. When a socialist government was formed in 1994, it was decided to keep the wealth tax and to revise the wealth tax law.

The rules valid between 1991 and 1995 specified that A-listed stocks were subject to wealth tax based on 75% of the year's closing stock price. O- and OTC-listed stocks were exempt from the wealth tax. Also, certain A-listed stocks were exempt. In particular, the exemption was applicable to stocks that had been introduced into the O and OTC lists before the beginning of 1992 and had been transferred to the A list after that date. Stocks that had not been listed at all (on any list) before that date but had become listed on the A list after that date were also exempt (Ds 1996:42 p. 24).<sup>3</sup> By the end of 1996, there were altogether 35 companies on the A list that were exempt from the wealth tax, in addition to all O- and OTC-listed stocks. The reason for these exemptions was a desire not to impose excessive tax burdens on the financing of smaller, growing firms.

In 1996, a governmental proposition (Prop. 1995/96:198; April 10 1996) was adopted, increasing the tax base to 100% of the year's closing stock price. In the spring of 1997, the government prepared the submission to the parliament of a revised wealth tax law. A proposition containing the revised law was sent to the parliament on April 9 1997 (Prop. 1996/97:117). That proposition was approved, and consequently the revised law was adopted, on May 29 1997. According to the revised law, O- and OTC-listed stocks would still be exempt from the wealth tax. All A-listed stocks would be taxable, with the tax base being 100% of the year's closing stock price. However, there would be an exemption for main owners. A main owner family, defined as the owner of at least 25% of the voting rights, would not have to pay wealth tax on its shares of stock, under the condition that the listing on the A list had taken place after the beginning of 1992.

The revised wealth tax law was considered very unfavorable from a business point of view. After May 29 1997, and continuing over the summer, 20 companies moved their shares from the A list to the O list or the OTC list. This stream of companies fleeing the A list was viewed as tax planning by the government. In order to stop such tax

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<sup>3</sup>Ds 1996:42 is a white paper from the Swedish Finance Ministry. It can be identified by its designation and is hence not listed among the references. Three governmental propositions to the Swedish parliament are mentioned in what follows. These are also not listed among the references, since again they can be identified from their designations. A similar remark applies to two official inquiries in the SOU series that are mentioned in the concluding Section 5.

planning, the government announced that it would amend the new wealth tax law. This announcement was made by the Minister of Taxes on September 9 1997. A governmental proposition submitted on September 11 1997 (Prop. 1997/98:1) contained the following provisions (changes in the wealth tax law): All stocks that had moved to the O or OTC lists from the A list after May 29 1997 would nevertheless be subject to the wealth tax, just as if they had remained on the A list. However, the tax base for stocks on the A list (and for stocks that had migrated to the other lists after May 29 1997) was lowered from 100% to 80% of the year's closing stock price. Also, the exemption for main owner families was extended to companies that had been listed on the A list before 1992. As a consequence of the failure of their moves from the A list to the O or OTC lists, 12 companies moved back to the A list in 1998 and 1999.

There is also an asymmetry between Swedish A-listed and O-listed stocks when it comes to the inheritance and gift taxes. The date of valuation for these taxes is the date of death or the date when a taxable gift becomes legally binding. Shares of stock on the A list are valued at 75% of the stock market price (quoted price) on the valuation day. Shares of stock on the O list are valued at 30% of the stock market price on the valuation day. These percentages have been valid during the entire period covered by this investigation. The government is currently (November 2004) proposing to abolish the inheritance and gift taxes.

Between 2000 and 2003, 8 companies moved from the A list to the O list, citing tax reasons. However, now those tax reasons referred to the inheritance and gift taxes. No company has moved from the O list to the A list since 2000. In a few cases in recent years, companies on the A list have managed to escape the wealth tax through rather complicated operations (e. g., merging an A-listed company with an O-listed one). The Stockholm Stock Exchange regrets that it is for the time being difficult to recruit companies to the A list, due to tax reasons (Viotti 2002-03 p. 354).

Table 1 contains some background information about the A and O lists on the Stockholm Stock Exchange in the last four years. It is seen from that table that there has, indeed, been a decrease of companies on the A list. It is also a suggestive piece of information in Table 1 that the average percentage ownership by (Swedish) individuals, as opposed to institutions or foreign investors, is much higher for stocks on the O list than for stocks on the A list. It seems quite probable that this is due to a preference by individuals for stocks that are exempt from the wealth tax. However, there may also be a size effect. Companies on the O list are obviously on average smaller than companies on the A list, and individuals may be more inclined to invest in small companies.<sup>4</sup>

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<sup>4</sup>On the other hand, the O-list includes 15 companies that have deserted the A list after May 29 1997 and are hence not exempt from the wealth tax. One of those companies is very large, the clothing retailer H&M (the 5th largest company in market value on the Stockholm Stock Exchange at the end of 2003,

**Table 1. The A and O lists of the Stockholm Stock Exchange 2000 - 2003**

	2000	2001	2002	2003
<i>The A list</i>				
Turnover (billion SEK)	3815	3603	2393	2107
Year end market value (billion SEK)	3056	2330	1359	1795
Number of new companies	3	2	1	0
Number of delisted companies	16	15	9	6
Year end number of quoted companies	83	70	62	56
Percent ownership by individuals	10.55%	10.31%	9.90%	10.33%
<i>The O list</i>				
Turnover (billion SEK)	617	392	309	345
Year end market value (billion SEK)	527	526	421	513
Number of new companies	99	23	12	6
Number of delisted companies	21	16	12	16
Year end number of quoted companies	228	235	235	225
Percent ownership by individuals	26.65%	27.55%	28.02%	27.67%

Data sources: Statistics Sweden (SCB) for percent ownership by individuals; Stockholm Stock Exchange for other items. Number of O-listed new companies in 2000 includes 51 transferred from the OTC list.

It is received wisdom in Swedish financial folklore that O-listed stocks are often purchased by individuals in December as a wealth tax shield (see, e. g., *Affärsvärlden*<sup>5</sup> No. 50, December 10 2003, p. 64). If that is true, one should notice a reverse year-end effect for stocks on the O list. The year-end effect, a widely cited anomaly, refers to the fact that returns on shares of stock tend to be low in December but high in January. Tax-loss selling by taxable individual investors and "window dressing" by institutional investors are cited as possible reasons (see, e. g., Poterba and Weisbenner 2001 for one recent article). Table 2 shows monthly returns on an A list index and an O list index, averaged over the years 1992 - 2003. It is seen that the A list index has a rather low average rate of return in December, and a somewhat higher average rate of return in January. This agrees with the year-end effect. The O list index, on the other hand, has a much higher average rate of return in December, in accordance with the reverse year-end effect. Another suggestive piece of evidence is that transaction prices for A-listed stocks that lost their wealth tax exemption in 1997 were relatively close to the upper end of the bid-ask spread in the 10

after Ericsson, Telia-Sonera, Nordea, and Astra-Zeneca).

<sup>5</sup>This is an influential Swedish business weekly. It publishes indices and a stock indicator containing various pieces of financial information. The *Affärsvärlden* classification of stocks into industries will be referred to in Section 4 below.

**Table 2. Monthly returns on A and O lists 1992 - 2003**

	<i>Jan.</i>	<i>Feb.</i>	<i>March</i>	<i>Apr.</i>	<i>May</i>	<i>June</i>	<i>July</i>	<i>Aug.</i>	<i>Sept.</i>	<i>Oct.</i>	<i>Nov.</i>	<i>Dec.</i>
A	2.57%	2.15%	-0.93%	2.91%	0.59%	-1.14%	0.73%	-1.99%	-4.30%	3.30%	5.73%	0.70%
O	2.54%	0.03%	-1.35%	1.54%	2.13%	-2.68%	1.11%	-1.91%	-2.24%	2.70%	6.00%	4.43%

Data source: AFGXA (A list) and OL (O list) indices from Trust-Findata.

final trading days of 1996. In the 10 final trading days of 1997, i. e., after those stocks had lost their tax exemption, their transaction prices were relatively close to the lower end of that spread.<sup>6</sup>

### **3. The relative fall in stock prices due to the loss of wealth tax exemption in 1997**

This section investigates rates of return in 1997 on two sets of stocks on the A list. For both sets, stocks are selected for inclusion subject to the condition that they should not have belonged to the Most actively traded segment of the A list both at the end of 1996 and at the end of 1997. This condition follows since both sets should be composed of medium-sized stocks. It is also an obvious condition for inclusion that the stocks in question should have been listed on the exchange (i. e., not delisted due to mergers etc.) between January 1 1997 and April 1 1998.

The first A-listed set consists of stocks that lost their previous wealth tax exemption as a consequence of the revised wealth tax law on May 29 1997. As already mentioned earlier, stocks from 35 companies lost that exemption. However, several of those stocks had to be excluded from the present investigation due to delistings. In the end, 23 stocks remained.<sup>7</sup> Four stocks out of the 23 belong to companies that moved down from the A to

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<sup>6</sup>This result was obtained by calculating daily closing bid prices, sell prices, and transaction prices for equally weighted portfolios of A-listed stocks that lost their tax exemption in 1997, A-listed stocks that had never been tax exempt, and O-listed stocks. The A-listed stocks of both categories are largely the same as in the following section.

<sup>7</sup>Those stocks are Allgon B, Assa Abloy B, B&N B, Cardo, Celsius B, Dahl, Elekta B, Getinge B, Graninge, Gunnebo, Höganäs B, K&M, Midway B, Munksjö, Nobel Biocare, PLM, Prifast, Scandic Hotels, Scribona B, Spendrups B, Svedala, TV4, and Wihlborg B. Letters (like B) after company names refer to particular share series. For companies with several share series, the most actively traded series are used in this paper. Stocks from the following six companies also belonged to the group of 35 that lost the wealth tax exemption but were delisted in 1997 and early 1998 due to mergers and buy-outs: Autoliv, Forcenergy, Frontline, M2 Fastigheter, Terra Mining, and United Tankers. Stocks from the following two companies were excluded due to take-over bids that had not been completed by April 1 1998: ICB Shipping and Linjebuss. This accounts for 31 of the 35 companies whose stocks lost the previous wealth

the O list. Since the set of eligible stocks is quite small, these four stocks are retained for the present investigation, even though that could imply a confounding of a tax effect and a list change effect.<sup>8</sup> Table 3 below includes a regression where these four stocks are not included. Four other stocks (mentioned at the end of footnote 7) were listed throughout on the Most actively traded segment of the A list and are hence not included in the first set of 23 A-listed stocks. Even so, Table 3 below shows alternative estimated regressions including also these four stocks, hinting at a possible company size effect.

The second A-listed set consists of stocks that were never exempt from the wealth tax to begin with. After applying the previous criteria (not listed on the Most actively traded segment of the A list, and not delisted between January 1 1997 and April 1 1998), 29 stocks were retained.<sup>9</sup> Both sets of stocks can be said to comprise mainly medium-sized companies. The average total stock market value of the 23 stocks in the first set at the beginning of 1997 is 3025 million SEK, of the 29 stocks in the second set 2248 million SEK. The companies in the first set are hence somewhat larger on average than those in the second set. However, these size measures include a possible valuation advantage to the first set from still being exempt from the wealth tax at the beginning of 1997. The corresponding average total stock market values at the beginning of 1998 are 3434 and 2721 million SEK.<sup>10</sup>

Cumulative Abnormal Returns (CARs) between May 29 and December 30 1997 (150 trading days) have been computed for two portfolios, the first one formed from the 23 A-listed stocks that lost the wealth tax exemption in 1997, and the second one from the 29 A-listed stocks that were never tax exempt in the first place.<sup>11</sup> The CARs are exhibited

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tax exemption. The remaining four stocks are Assi Domän, Föreningssparbanken A, Kinnevik B, and Scania B. These were listed on the Most actively traded segment of the A list both at the end of 1996 and at the end of 1997.

<sup>8</sup>The four stocks in question are Allgon B, Assa Abloy B, Graninge, and B&N B. The first three of these were part of the protest moves from the A list in the summer of 1997. The last one moved from the A to the O list later in 1997. The effect of a change of stock exchange list, while not uninteresting in itself, is not the topic of this paper. For a survey of that topic, see Baker and Meeks 1991.

<sup>9</sup>Those stocks are ASG B, Beijer B, Bilia A, Bilspedition B, BPA B, BT Industrier, Bure, Consilium B, Esselte B, Evidentia A, Finnveden B, Haldex, Geveko B, Gotland B, Hexagon B, Hufvudstaden A, JM Bygg, JP Bank B, Lindex, NCC B, Piren, Platzer B, SAS, Scancem A, Scandiaconsult, Seco Tools B, Spectra-Physics A, Stena Line B, and Ångpanneföreningen B. (Daily stock prices and values of the SIXRX general index have been obtained from Trust-Findata.)

<sup>10</sup>In the sequel, "total stock market value" is referred to simply as "total market value". Total market value data have been obtained from Trust-Findata. Total market values refer to individual share series, i. e., not total company values for companies with several share series. If the four large company stocks that were mentioned at the end of footnote 7 are also included in the first set of A-listed stocks, then the average total market value of that set at the beginning of 1997 becomes 5542 Million SEK.

<sup>11</sup>Letting May 29 be the starting day for CARs is conservative, since the market may already earlier

in Figure 1. The bottom curve pertains to stocks that lost the tax exemption, the top one to stocks that were never tax exempt to begin with. The first portfolio has been formed by putting equal weights (1/23) of the initial amount into each stock in the first set on January 1 1997, the second by putting equal weights (1/29) into each stock in the second set also on January 1 1997. These portfolios are then assumed to be held in a passive (buy-and-hold) fashion, with dividends reinvested, and the daily rates of return on the portfolios are calculated day by day. CARs are calculated after adjustment for movements in the general market, represented by the SIXRX index. This is a return index for the Swedish stock market that accounts for reinvesting of cash dividends. In other words, portfolio returns are viewed as abnormal after adjustment by the conventional market model. Market model parameters are computed by ordinary least squares regression, with an estimation period of 84 days, between January 16 and May 20 1997. The standard error of the regression is computed using the same estimation period.

It is seen from Figure 1 that CARs are negative for the portfolio that lost the wealth tax exemption, ending at  $-8.8\%$  on December 30 1997. The CARs for that portfolio are not significantly different from zero. The  $t$  values towards the end of 1997 are between  $-0.7$  to  $-0.9$ . The  $t$  value for December 30 1997 is  $-0.70$ .<sup>12</sup> This picture does not change very much, if the four stocks that moved down from the A list to the O list in 1997 are not included.

The other portfolio, with stocks that never enjoyed the tax exemption, exhibits CARs in Figure 1 that eventually become positive, ending at  $+11.1\%$  on December 30 1997, with a  $t$  of 1.11. The difference in CARs between the two sets of stocks hence ends up at around  $-20\%$  on December 30 1997. This suggests a relative fall in stock prices of the order of 20% that is suffered by the stocks in the first set as a consequence of the elimination of the wealth tax exemption, compared to the stocks in the second set. Following DeGennaro and Thomson 1995 p. 1411, the hypothesis has been tested that the daily abnormal return of the first portfolio is equal to the daily abnormal return of the second portfolio, with a  $t$  test. This test uses all observations of (un-cumulated) abnormal returns between May 29 and December 30 for both portfolios. It provides a  $t$  of  $-1.616$  which just misses significance at the 10% level.

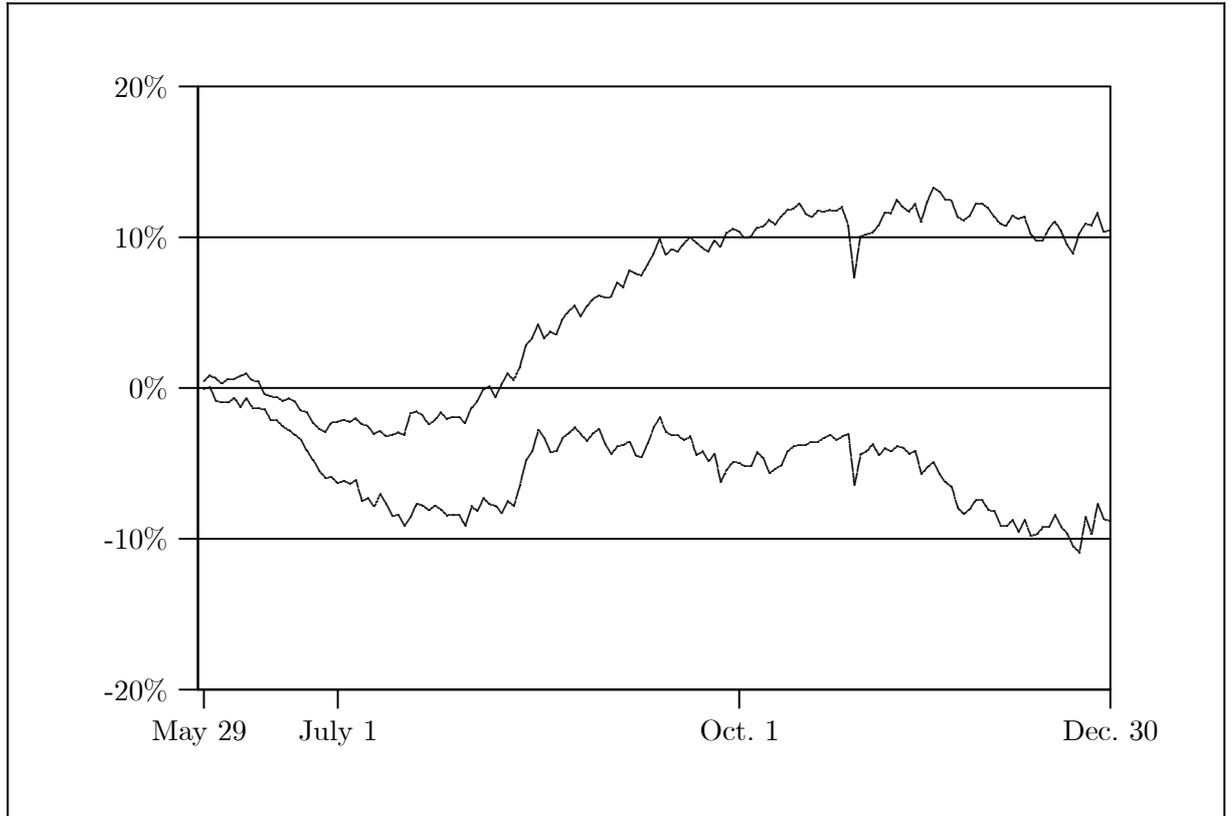
Next, a simple regression model has been estimated with rate of return as dependent variable and accounting earnings per share (as a fraction of last year's stock price) and a

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have anticipated the parliament decision on the revised wealth tax law, e. g., from April 9 when the governmental proposition was sent to the parliament. However, judging from newspaper comments at the time, there may have been expectations (or hope) until May 29 that the proposed wealth tax law would be amended in one way or another.

<sup>12</sup> $t$  values are computed according to formulas (2) and (3) of Mikkelsen and Partch 1988, p. 122 (after correcting for a misprint in formula (3)). This way of computing  $t$  values is applicable to CARs over longer windows.

**Figure 1. Cumulative Abnormal Returns (CARs) for portfolios of the two sets of A-listed stocks between May 29 and December 30 1997**



dummy variable for loss of wealth tax exemption as independent variables. More precisely, the model is

$$R_j = \alpha_0 + \alpha_1 \cdot (X_j/P_j) + \alpha_2 \cdot I_j + \epsilon_j,$$

where  $R_j$  is the rate of return on stock  $j$  (including dividends) between the first stock market trading day in April 1997 and the first trading day in April 1998,  $X_j$  the accounting earnings per share during 1997 (assumed to be reported and hence publicly known by April 1998), and  $P_j$  the market value per share of stock  $j$  on the first trading day in April 1997 (i. e., the stock price one year ago).  $I_j$  is a dummy variable with value 1 if stock  $j$  belongs to the set of A-listed stocks that lost the wealth tax exemption in 1997 and 0 otherwise. Apart from the dummy variable, this model is the same as equation (1) p. 825 in Warfield and Wild 1992. The following extended model has also been estimated, with total market value at the beginning of 1997 (in million SEK), denoted by  $M_j$ , as an additional independent variable:

$$R_j = \alpha_0 + \alpha_1 \cdot (X_j/P_j) + \alpha_2 \cdot I_j + \alpha_3 \cdot M_j + \epsilon_j.$$

**Table 3. Results of regressions in Section 3 of stock returns on accounting earnings, dummy for loss of wealth tax exemption, and total market value**

		$\hat{\alpha}_0$	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\alpha}_3$	$R^2$
$n = 45$	Regression parameter	0.077	3.274	-0.136		0.321
	$t$ value	1.356	4.335	-1.787		
$n = 42$	Regression parameter	0.085	3.019	-0.092		0.301
	$t$ value	1.549	4.081	-1.194		
$n = 49$	Regression parameter	0.079	3.206	-0.092		0.271
	$t$ value	1.317	4.088	-1.195		
$n = 49$	Regression parameter	0.046	3.125	-0.138	1.490E-05	0.346
	$t$ value	0.769	4.158	-1.809	2.278	

Some stocks were eliminated from the regressions, more precisely 7 stocks, for two reasons. In the first place, five stocks<sup>13</sup> undertook cash issues of new shares in 1997 and were thus eliminated to avoid ambiguous adjustments of reported accounting earnings per share. Two companies<sup>14</sup> were deleted due to an accounting year different from the calendar year. Stock returns have been calculated using data, in particular, quoted stock prices, from the Stockholm Stock Exchange. Earnings per share in 1997 have been taken from the Affärsvärlden stock indicator.

Estimated regressions are shown in Table 3. The first regression uses 45 stocks and is consequently denoted by  $n = 45$  (so  $n$  is the number of observations, i. e., stocks). This is the sum of 23 stocks from the first A-listed set plus 29 stocks from the second set minus 7 stocks that were deleted. The second regression, denoted by  $n = 42$ , deletes from the previous 45 stocks three out of the four stocks that moved down from the A list in 1997 (the fourth one of these stocks has already been deleted to arrive at 45 stocks in the first regression). The third and fourth regressions add the four large stocks that were mentioned at the end of footnote 7 to the 45 in the first regression. The difference between the third and fourth regressions is apparently that total market value is added as an independent variable in the fourth regression.

Of the first three regression parameters, only  $\hat{\alpha}_1$  is significantly different from zero on the 5% level in all four regressions. In the first and fourth regressions,  $\hat{\alpha}_2$  is significant on the 10% level.  $\hat{\alpha}_2$  is of course particularly interesting, since it expresses the estimated value loss (or more precisely: rate of return loss) from the loss of the wealth tax exemption. That loss appears to be of the magnitude of -10% (more precisely, between -9.2% and

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<sup>13</sup> Assa Abloy B in the first stock set, and BT Industrier, Gotland B, Piren, and Platzer B in the second stock set.

<sup>14</sup> Elekta B and Lindex.

-13.8%).

Adding total market value as a third independent variable in the first two regressions in Table 3 results in fairly small changes in  $\hat{\alpha}_0$ ,  $\hat{\alpha}_1$ ,  $\hat{\alpha}_2$ , and  $R^2$ . Also, the  $F$  ratios for the extra contribution of the additional regressor are close to zero. Adding total market value as an independent variable to the third regression has a more important effect, however, as can be seen by comparing the third and fourth regressions. This indicates that there could be a size effect. This is further commented on in the conclusion.

All regressions in Table 3 pass the White test for heteroscedasticity. That is, homoscedasticity cannot be rejected on the 5% level.

## 4. The impact of wealth tax status on stock prices 2000 - 2003

This section investigates the effect of the wealth tax on stock prices using data pertaining to the years 2000 - 2003. The stocks that are included are listed in Table 4.<sup>15</sup> One observation in the data set consists of a combination of a stock and a year, also referred to as a stock/year observation. Altogether, there are 412 stock/year observations, as also seen from the end of Table 4. (In other words, there are 412 + signs in total in Table 4.) A given stock can apparently be included in the data set at most four times (once for each year 2000 - 2003). In many cases, a stock is included less than four times, due to delistings, mergers, missing data, and new (first time) listings after the beginning of 2000.

The data set has been put together as follows. A collection of non-tax exempt stocks has been assembled consisting of all A listed stocks except the ones in the Most actively traded segment of the A list. Non-tax exempt stocks on the O list (i. e., stocks that have moved from the A to the O list after May 29 1997) have also been included in that collection (with the exception of H&M). For the stocks in that collection, stock/year observations have been formed for those years for which data are available. These are the non-tax exempt observations. It is seen from the end of Table 4 that there are 148 such observations. A collection of tax exempt stocks has been assembled by picking all tax-exempt stocks on the O list that have been included in the Attract 40 segment at least once during 2000 - 2003. Again, stock/year observations have been formed for those stocks and those years for which data are available. These are the tax exempt observations. There are apparently 264 such observations, as also seen from the end of Table 4. The intention has been to form observations from stocks in medium-sized companies. Table 6 gives information about average total market values for the stocks in question at the year

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<sup>15</sup>Tables 4, 5, and 8 are inserted at the end of the paper, since they are fairly lengthy.

**Table 6. Average total market values for stock/year observations in the Section 4 data set at the year beginnings of 2000 - 2003 (million SEK)**

	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>
All stocks	4212	3651	2984	2809
All non-tax exempt	5059	4426	4191	3828
All tax exempt	3587	3216	2388	2331
All non-Hi tech	3761	3765	3794	3587
All Hi tech	5088	3447	1534	1492
All non-tax exempt, non-Hi tech	4430	4197	4178	3815
All tax exempt, non-Hi tech	2696	3277	3431	3366

Data source: Trust-Findata.

beginnings of 2000 - 2003. It is seen from Table 6 that average total market values for non-tax exempt and tax exempt stocks are not too different. The non-tax exempt stocks have higher total market values on average, though.

The Affärsvärlden industry classification of each company is also shown in Table 4 (the last column). Industry membership is designated by a number between 1 and 31. Table 5 gives the correspondence between industry and number between 1 and 31. Table 5 also gives the breakdown of stock/year observations into industries, further broken down into non-tax exempt and tax exempt (the last two columns). Stock/year observations can also be broken down into non-Hi tech and Hi tech. This distinction is interesting, since some Hi tech stocks may have been unrealistically priced in the bubble years of 2000 and 2001. Hi tech is defined here as biotechnology, information technology consultants, information technology software, telephone and data communications, telecom operators, and telecom subcontractors (the industries with Affärsvärlden classification numbers 17, 24, 25, 27, 28, and 29 in Table 5). It is seen at the end of Table 4 that there are 147 Hi tech observations in total, and consequently 265 non-Hi tech. From Table 6, it is clear that average total market values of Hi tech stocks declined considerably between 2000 and 2003. Table 5 also displays the dummy variable index (between 7 and 16) for each industry that is used in the regressions that are reported in Table 8 below.

All data that are used in this section have been obtained from Trust-Findata. There are 39 stock/year observations where the stock was subject to a cash issue of new shares in that year. These observations are included in what follows, even though it was stated in the previous section that it is an ambiguous operation to adjust accounting earnings (and book values) for new issues. Actually, deleting these 39 observations does not change the results that are reported in Table 8 below in a major fashion. In particular, the results

in column 3 of Table 8 change rather little.<sup>16</sup>

Initially, the following regression has been estimated. It relates the market value of a stock to the book value, to accounting earnings, and to a dummy variable for not being exempt from the wealth tax. It is noted that the market value on the left hand side and the book value and accounting earnings on the right hand side are scaled by last year's book value.

$$(P_{j,t}/B_{j,t-1}) = \alpha_0 + \alpha_1 \cdot (B_{j,t}/B_{j,t-1}) + \alpha_2 \cdot (X_{j,t}/B_{j,t-1}) + \alpha_3 \cdot I_j^1 + \epsilon_{j,t}.$$

$P_{j,t}$  is the quoted stock price per share of stock  $j$  on the first trading day in April of the year following after year  $t$  (since all accounting information concerning year  $t$  is assumed to be publicly known by April of the following year).  $B_{j,t}$  is the book value per share of stock  $j$  at the end of year  $t$ , and  $B_{j,t-1}$  the book value per share at the end of year  $t - 1$ .  $X_{j,t}$  denotes accounting earnings per share of stock  $j$  during year  $t$ . The year index  $t$  is apparently equal to 2000, 2001, 2002, or 2003. A couple of companies in the data set use accounting years that are different from calendar years. In those cases, the time scale is moved forward by a corresponding number of months. As already suggested earlier, relating the market value of a stock to book value and accounting earnings follows the spirit of Ohlson (1995). The dummy variable  $I_j^1$  takes value 1 if stock  $j$  is non-tax exempt and 0 otherwise (the same for all years, since no company in the data set was subject to a change in wealth tax status during 2000 - 2003).

Results are shown in Table 7 for four different regressions. The results of each regression comprise two lines, the first one of which contains estimated regression parameters and  $R^2$ . The second line displays  $t$  values. All  $t$  values in Table 7 and also in Table 8 below are heteroscedasticity consistent according to the White procedure. The four regressions are identified by different sets of included observations in column A. The first one uses all 412 stock/year observations and is hence denoted by  $n = 412$ . The second one, marked by  $n = 265$ , only includes the 265 non-Hi tech observations. The third one, denoted by  $n = 203$ , includes Hi tech as well as non-Hi tech observations, but only pertaining to the last two years (apparently, there are 203 observations in all from the last two years, as can also be inferred from the end of Table 4). The fourth regression, denoted by  $n = 129$ , includes only non-Hi tech observations, and only from the last two years. By successively limiting the set of included observations in this fashion, some account is taken of the fact

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<sup>16</sup>Cash issues are almost invariably rights issues in Sweden. Suppose that  $K$  is the price of the stock on the day before the issue,  $T$  the per share price of the new issue, and that  $f$  is the number of new shares that can be acquired by the owner of one old share. The correction factor for the new issue that is used by Trust-Findata follows from a recommendation by the Swedish Society of Financial Analysts and is as follows:  $(1 + \frac{T \times f}{K}) / (1 + f)$ . This correction factor is used for multiplying all preceding quoted market prices. It is also used for multiplying the number of shares in the computation of preceding book values per share and accounting earnings per share.

**Table 7. Results of regressions in Section 4 of market value on book value, accounting earnings, and dummy variable for non-tax exempt (line 1: parameters; line 2:  $t$  values)**

A	0 $\hat{\alpha}_0$	1 $\hat{\alpha}_1$	2 $\hat{\alpha}_2$	3 $\hat{\alpha}_3$	C $R^2$
$n = 412$	0.583 1.128	2.419 4.761	1.883 1.456	-1.061 -3.125	0.426
$n = 265$	-0.370 -0.609	2.647 4.310	3.667 3.018	-0.661 -2.571	0.504
$n = 203$	0.204 0.300	2.386 3.027	1.302 0.933	-0.587 -2.322	0.260
$n = 129$	1.566 2.134	0.225 0.276	6.042 4.524	-0.369 -1.674	0.505

that Hi tech stocks may have been priced differently from non-Hi tech ones, and that the first two years 2000 and 2001 may have been bubble years compared to the last two years 2002 and 2003.

This regression model may be misleading, however, and is therefore immediately rejected. The reason is that non-tax exempt and tax exempt observations are not uniformly distributed across industries. For instance, there is a clear domination of non-tax exempt observations in some traditional industries. This indicates that one should control for industry by means of dummy variables. Since there may be effects due to changes in market exuberance from one year to another, dummy variables for years should also be included.

The following regression model extends the previous model by adding two categories of dummy variables:

$$(P_{j,t}/B_{j,t-1}) = \alpha_0 + \alpha_1 \cdot (B_{j,t}/B_{j,t-1}) + \alpha_2 \cdot (X_{j,t}/B_{j,t-1}) + \alpha_3 \cdot I_j^1 + \sum_{s=4}^6 \alpha_s \cdot I_s^2 + \sum_{i=7}^{16} \alpha_i \cdot I_{i,j}^3 + \epsilon_{j,t}.$$

The first new category of dummy variables comprises  $I_4^2$ ,  $I_5^2$ , and  $I_6^2$ .  $I_4^2$  takes value 1 if year  $t$  is the first year (2000) and zero otherwise.  $I_5^2$  takes value 1 if year  $t$  is the second year (2001) and zero otherwise.  $I_6^2$  takes value 1 if year  $t$  is the third year (2002) and zero otherwise. The second new category of dummy variables consists of  $I_{7,j}^3, I_{8,j}^3 \dots I_{16,j}^3$ . The lower index  $i$  between 7 and 16 corresponds to a (main) industry in Table 5, as follows:  $i = 7$ : raw materials;  $i = 8$ : manufacturing;  $i = 9$ : consumer goods;  $i = 10$ : health

care except biotechnology;  $i = 11$ : biotechnology;  $i = 12$ : financial;  $i = 13$ : information technology hardware and distributors;  $i = 14$ : information technology except hardware and distributors;  $i = 15$ : telecom;  $i = 16$ : media and entertainment. Apparently,  $i = 11$ ,  $i = 14$ , and  $i = 15$  denote Hi tech industries. A dummy variable in this category takes value 1 if firm  $j$  belongs to the corresponding (main) industry, and zero otherwise. The dummy variables in this category have no index for year, since the industry classification of each company is the same in all four years. Apparently, and as can also be inferred from Table 5, it is the last main industry, services, that gets no dummy variable.

Results of four different regressions are given in Table 8. They are defined by the same four sets of included observations as in Table 7. Also as in Table 7, the results of each regression are given in two lines, with the first line showing estimated regression parameters and  $R^2$ , and the second line  $t$  values (corrected for heteroscedasticity). (In three of the regressions that are reported in Table 8, the summations over indices for dummy variables are apparently over subsets of  $s$  from 4 to 6 and  $i$  from 7 to 16.)

The estimated parameter that is of particular interest is  $\hat{\alpha}_3$ , associated with the dummy variable for not being exempt from the wealth tax. It is substantially smaller in absolute value in Table 8 than in Table 7. In the first regression of Table 8,  $\hat{\alpha}_3 = -0.288$ . This means that the estimated decrease in market value divided by last year's book value from being non-tax exempt is  $-0.288$ . The average ratio (denoted  $\bar{y}$ ) between market value and last year's book value for all 412 stock/year observations is seen in column D to be 2.815. Dividing  $-0.288$  by 2.815, one obtains the estimated average decrease in market value per share from not being tax exempt,  $\hat{\alpha}_3/\bar{y}$  in column E, as 10.2%. In the second regression with  $n = 265$ , the industry dummy variables  $I_{11,j}^3$ ,  $I_{14,j}^3$ , and  $I_{15,j}^3$  drop out, since Hi tech stocks are not included. Now  $\hat{\alpha}_3 = -0.283$  and  $\hat{\alpha}_3/\bar{y} = -11.0\%$ . In the third regression, the year dummies  $I_{4,j}^3$  and  $I_{5,j}^3$  are not included, since all observations pertain to 2002 and 2003. Somewhat surprisingly,  $\hat{\alpha}_3$  is now *positive*, although small in absolute value.<sup>17</sup> In the fourth regression, which only uses non-Hi tech observations pertaining to the last two years, the dummy variables  $I_{4,j}^3$ ,  $I_{5,j}^3$ ,  $I_{11,j}^3$ ,  $I_{14,j}^3$ , and  $I_{15,j}^3$  all drop out. Now,  $\hat{\alpha}_3 = -0.119$  and  $\hat{\alpha}_3/\bar{y} = -5.8\%$ .

In each of the four regressions in Table 8,  $\hat{\alpha}_3$  is not significantly different from zero. The general impression is that there may exist a value effect from not being exempt from the wealth tax, a decrease on the order of from 5% to 10%, at least in some cases. That effect seems weaker for Hi tech than for non-Hi tech stocks. Also, it seems to have become weaker in 2002 and 2003, compared to 2000 and 2001.

It is seen that  $R^2$  values are a fair amount higher in Table 8 than in Table 7. It is interesting to note that some of the parameters associated with dummy variables in Table 8 are significantly different from zero. In particular, this holds for the year 2002 dummy,

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<sup>17</sup>Deleting one outlier (Icon Medialab 2003) does not change  $\hat{\alpha}_3$  very much.

the raw materials industry dummy, the manufacturing industry dummy, and the financial industry dummy (significant on at least the 10% level in all four regressions in Table 8). Generally speaking, the (accounting) value relevance of the regression model in Table 8 is quite high. Apparently, book values, earnings, and industry dummies provide reasonably good explanations of observed stock market values. There is an important drop in  $\hat{\alpha}_1$  (the parameter that is associated with book value) between the first three regressions and the fourth one (in Table 7 as well as in Table 8). There is no immediate suggestion of a reason for this result.

## 5. Conclusion

At the end of the present investigation, the conclusion is that the wealth tax may imply a reduction in market value for non-exempt stocks in the order of magnitude of 5% to 10%, at least in certain situations, compared to what the market value would have been in the absence of that tax. This is obviously a very imprecise summary of percentages that were mentioned in Sections 3 and 4. To reiterate from Section 4, the wealth tax effect seems to be less important for Hi tech stocks than for stocks of firms in more traditional industries. Also, it has become weaker in the most recent years (2002 and 2003). However, this final conclusion is not a very firm one. One regression in Table 8 (Section 4) actually indicates a very small but *positive* effect on value from not being exempt from the wealth tax, contrary to what one would have expected in advance. The regression parameters relating to the wealth tax are not statistically significant in Section 4 (Table 8), and only partly so in Section 3 (Table 3). The CAR investigation in Section 3 also does not provide a statistically significant result.

Apparently, this paper has failed to provide clear evidence of a wealth tax effect on the stock prices of medium-sized companies. Even though the results are suggestive, they can only be viewed as further indications that a wealth tax effect may exist, in line with the suggestive background data that were cited at the end of Section 2 above. It is actually somewhat surprising that a significant wealth tax effect cannot be established, given that such an effect is often discussed in the Swedish financial press, and that a number of companies have taken the drastic step of changing their stock exchange listing from A to O in 1997 and (in a couple of cases) in more recent years.

Section 4 considers only medium-sized companies. Very large ones (like the ones mentioned in footnote 4 above) are not included, nor are very small O-listed ones. The reason for including only medium-sized companies was a desire to avoid possible size effects due to, e. g., investment in large Swedish companies by foreign institutions. For stocks that are not exempt from the wealth tax, large company size may be positive for the market value per share. The larger the company, the more attractive it becomes

for institutional investors, e. g., foreign institutions. In other words, large size may to some extent compensate for the disadvantage of not being exempt from the wealth tax. This possibility, which is also hinted at in the fourth regression in Table 3 (Section 3), suggests an extension of the present paper: It could be interesting to include a wider set of companies, in particular very large ones. Given the limited number of listed companies in Sweden (cf. Table 1 above), that extension would not be very substantial, though.

The fact that the wealth tax effect may have become weaker in the most recent years could, in fact, be due to ongoing political considerations. One authoritative recent official inquiry (SOU 2002:47 *Våra skatter?*) that appeared towards the end of 2002 suggested that the wealth tax base should be broadened to include all important assets (presumably including O-listed stocks) and that the tax rate should be significantly lowered. A similar proposal was contained in another prominent recent official inquiry (SOU 2004:36 *Reformerade egendomsskatter*). In fact, for some time there has been a fair amount of pressure on the Swedish government to eliminate or at least alleviate the wealth tax asymmetry between A-listed and O-listed stocks (preferably by abandoning the wealth tax altogether). The final outcome of that pressure remains to be seen. At the time of writing (November 2004), the government is proposing to eliminate the inheritance and gift taxes, as already mentioned in Section 2 above. Also as already mentioned in Section 2, those taxes also imply an asymmetry between A-listed and O-listed stocks, to the detriment of the former. The weakening of the wealth tax effect in 2002 and 2003 that is suggested by the results in Section 4 is perhaps due to expectations that the asymmetric tax treatment of A- and O-listed stocks will be eliminated in the not too distant future.

The discussion in the previous paragraph indicates another possible extension of this paper: Even though this paper has not found conclusive evidence of a wealth tax effect, one can imagine that there could be detectable realignments of stock prices, if the wealth tax asymmetry is weakened or even eliminated in the next couple of years. It could be an interesting future research project to try to measure the extent of such realignments.

## References

- [1] Baker, H. Kent, and Sue E. Meeks (1991), "Research on Exchange Listings and Delistings: A Review and Synthesis", *Financial Practice and Education*, Spring 1991, pp. 57-71.
- [2] DeGennaro, Ramon P., and James B. Thomson (1995), "Anticipating Bailouts: The Incentive-Conflict Model and the Collapse of the Ohio Deposit Guarantee Fund", *Journal of Banking and Finance*, Vol. 19, pp. 1401-1418.

- [3] Liljeblom, Eva, Anders Löflund, and Kaj Hedvall (2001), "Foreign and Domestic Investors and Tax Induced Ex-Dividend Day Trading", *Journal of Banking and Finance*, Vol. 25, pp. 1687-1716.
- [4] Mikkelson, Wayne H., and M. Megan Partch (1988), "Withdrawn Security Offerings", *Journal of Financial and Quantitative Analysis*, Vol. 23, No. 2, pp. 119-133.
- [5] Ohlson, James A. (1995), "Earnings, Book Values and Dividends in Equity Valuation", *Contemporary Accounting Research*, Vol. 11, No. 2 (Spring 1995), pp. 661-687.
- [6] Poterba, James M., and Scott J. Weisbenner (2001), "Capital Gains Tax Rules, Tax-Loss Trading, and Turn-of-the-Year Returns", *The Journal of Finance*, Vol. 56, No. 1 (February 2001), pp. 353-368.
- [7] Skatteverket (Swedish Tax Agency) (2003), *Skattestatistisk årsbok 2003* (Tax Statistical Yearbook of Sweden 2003, in Swedish) (Skatteverket, Stockholm).
- [8] Viotti, Pernilla (2002-03), "Marknadsnotering och annan notering av finansiella instrument – betydelsen inom skatterätten" (Market Listing and Other Listing of Financial Instruments – Its Significance within Tax Law, in Swedish), *Juridisk Tidskrift*, Vol. 14, No. 2, pp. 352-371.
- [9] Warfield, Terry D., and John J. Wild (1992), "Accounting Recognition and the Relevance of Earnings as an Explanatory Variable for Returns", *The Accounting Review*, Vol. 67, No. 4 (October 1992), pp. 821-842.

**Table 4. Stock/year observations, and industry memberships**

<i>Stock</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>Industry</i>
<i>Non-tax exempt</i>					
Allgon B	+	+	+		29
Atle	+				21
Axfood	+	+	+	+	15
Beijer B	+	+	+	+	9
Bergman & Beving B	+				9
Bilia A	+	+	+	+	14
Bure	+	+	+	+	21
Cardo	+	+	+	+	7
Consilium B	+	+	+		13
Custos	+	+	+	+	21
Esselte B	+	+			10
Finnveden B	+	+	+	+	8
Getinge B	+	+	+	+	18
Gunnebo	+	+	+	+	13
Haldex	+	+	+	+	8
Hexagon B	+	+	+	+	7
Hufvudstaden A	+	+	+	+	23
Höganäs	+	+	+	+	3
JM B / JM	+	+	+	+	6
Kinnevik B	+	+	+	+	21
Lindab B	+				6
Lindex	+	+	+		14
Midway B	+	+	+	+	7
Munksjö	+	+			4
NCC B	+	+	+	+	6
Nobel Biocare	+	+			18
OM / OMHEX		+	+	+	22
Perstorp B	+				2
Platzer B	+				23
Sapa	+	+	+	+	3
Sardus	+	+	+	+	15
SAS Sverige / SAS			+	+	11
Scandiaconsult	+	+	+		12
Scandic Hotels	+				31

Table 4 cont'd (part 2)

<i>Stock</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>Industry</i>
SCANIA B	+	+	+	+	8
Scribona B	+	+	+	+	26
Seco Tools B	+	+	+	+	8
Spendrups B	+				15
Svedala	+				8
Sydkraft A / C	+				5
Ticket Travel	+	+	+	+	31
Trelleborg B	+	+	+	+	7
TV4 A	+	+	+	+	30
Wihlborgs B	+	+	+	+	23
WM-data B	+	+	+	+	24
Ångpanneföreningen B	+	+	+	+	12
Öresund	+	+	+	+	21
<i>Tax exempt</i>					
Active Biotech B	+	+	+	+	17
Adera B (Addnode)	+	+	+	+	24
Alfa Laval				+	8
Alfaskop	+				24
Anoto Group		+	+	+	26
Artimplant B	+	+	+	+	18
Axis		+	+	+	27
Biacore	+	+	+	+	18
Billerud				+	4
Biora	+	+	+		17
Bong Ljungdahl	+	+	+	+	10
Boss Media	+	+	+	+	25
Broström B	+	+	+	+	11
Capio			+	+	19
Carnegie & Co			+	+	22
Castellum	+	+	+	+	23
Cloetta Fazer B	+	+	+	+	15
DORO	+	+	+	+	27
Drott B	+	+	+	+	23
Elanders B	+	+	+		10
Enea Data	+	+	+		24

**Table 4 cont'd (part 3)**

<i>Stock</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>Industry</i>
Eniro			+	+	31
Framtidsfabriken	+	+	+	+	24
Frontec B	+			+	24
HiQ International	+	+	+	+	24
HOIST B		+	+		22
IBS B	+	+	+	+	25
Icon Medialab	+	+	+	+	24
IFS B	+	+	+	+	25
Intentia B	+	+	+	+	25
Intrum Justitia				+	31
Invik B	+	+	+	+	21
Karlshamns	+	+	+	+	2
Karo Bio	+	+	+	+	17
Kungsleden	+	+	+	+	23
Lundin Oil B	+				1
Mandamus	+	+	+		23
Medi Team (Biolin)	+	+	+		18
Medivir B	+	+	+	+	17
Micronic Laser Systems		+	+	+	26
Modern Times Group B	+	+	+	+	30
Modul 1 Data	+	+	+	+	24
Munters	+	+	+	+	13
Net Insight B	+	+	+	+	27
New Wave B	+	+	+		14
Nobia				+	14
NOCOM B	+	+	+	+	25
Observer B	+	+	+	+	30
Orc Software			+	+	25
Pandox	+	+	+		23
PartnerTech	+	+	+	+	29
Peab B	+	+	+	+	6
Pergo			+	+	6
Poolia B	+	+	+	+	31
Pricer B	+	+	+	+	25
ProAct IT Group	+	+	+	+	24

**Table 4 cont'd (part 4)**

<i>Stock</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>Industry</i>
Proffice B		+	+	+	31
Protect Data	+	+	+	+	25
PyroSequencing A (Biotage)		+	+	+	18
Q-Med		+	+	+	18
ReadSoft ser. B	+	+	+	+	25
Resco B	+	+	+	+	24
Rottneros	+	+	+	+	4
SAAB B	+	+	+	+	8
SECTRA B	+				18
Semcon	+	+	+	+	12
Sigma B				+	24
SkiStar B	+	+	+		31
Softronic B	+	+	+	+	24
SwitchCore	+	+	+	+	27
Technology Nexus	+	+	+	+	25
Tele1 Europe Hold (Song)		+	+	+	28
Tele2 B	+	+	+	+	28
Teleca B	+	+	+	+	24
Telelogic	+	+	+	+	29
Teligent	+	+	+	+	25
Tornet	+	+	+		23
Trio	+	+	+	+	25
TurnIT B	+	+	+	+	24
Utfors		+	+		28
	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>Total</i>
Number of stock/year observations	106	103	106	97	412
Of which non-tax exempt	45	37	35	31	148
Of which tax exempt	61	66	71	66	264
Of which non-Hi tech	70	66	68	61	265
Of which Hi tech	36	37	38	36	147
Of which non-tax exempt, non-Hi tech	43	35	33	30	141
Of which tax exempt, non-Hi tech	27	31	35	31	124

**Table 5. The Affärsvärlden (AffV.) classification, regression dummy variable indices, and number of non-tax exempt and tax exempt stock/year observations in Section 4 data set by industries**

<i>Main industry</i>	<i>Industry</i> [regression dummy variable index] Hi tech industries in <i>italics</i>	<i>AffV.</i> <i>no.</i>	*)	**)
Raw materials	Oil and gas [7]	1	0	1
	Chemical [7]	2	1	4
	Mining and metals [7]	3	8	0
	Forestry [7]	4	2	5
	Power [7]	5	1	0
Manufacturing	Construction and contracting [8]	6	9	6
	Industrial conglomerates [8]	7	16	0
	Vehicles and machinery [8]	8	17	5
	Wholesalers [8]	9	5	0
	Printers and office products [8]	10	2	7
	Transportation [8]	11	2	4
	Technical consultants [8]	12	7	4
	Other industry [8]	13	7	4
Consumer goods	Rarely purchased items [9]	14	7	4
	Daily consumption items [9]	15	9	4
Health care	Pharmaceutical [10]	16	0	0
	<i>Biotechnology</i> [11]	17	0	15
	Medical technology [10]	18	6	18
	Health care services [10]	19	0	2
Financial	Banks and insurance [12]	20	0	0
	Investment and financial management [12]	21	17	4
	Other financial services [12]	22	3	4
	Real estate [12]	23	9	21
Information techn.	<i>Consultants</i> [14]	24	4	47
	<i>Software</i> [14]	25	0	46
	Hardware and distributors [13]	26	4	6
Telecom	<i>Telephone and data communications</i> [15]	27	0	15
	<i>Telecom operators</i> [15]	28	0	9
	<i>Telecom subcontractors</i> [15]	29	3	8
Media and entertainm.	[16]	30	4	8
Services		31	5	13

\*) Number of non-tax exempt stock/year observations.

\*\*\*) Number of tax exempt stock/year observations.

**Table 8. Results of regressions in Section 4 of market value on book value, accounting earnings, and dummy variables for non-tax exempt, years, and main industries (line 1: parameters; line 2:  $t$  values)**

A	0	1	2	3	4	5	6	7	8	9
	$\hat{\alpha}_0$	$\hat{\alpha}_1$	$\hat{\alpha}_2$	$\hat{\alpha}_3$	$\hat{\alpha}_4$	$\hat{\alpha}_5$	$\hat{\alpha}_6$	$\hat{\alpha}_7$	$\hat{\alpha}_8$	$\hat{\alpha}_9$
$n = 412$	1.352	2.208	2.454	-0.288	0.244	-0.157	-0.977	-1.799	-1.445	-0.750
	1.956	4.840	1.616	-1.220	0.548	-0.590	-3.866	-2.985	-2.617	-1.073
$n = 265$	1.284	2.246	4.313	-0.283	-0.346	0.176	-0.598	-2.018	-1.664	-1.177
	1.753	3.973	3.798	-1.115	-1.018	0.627	-2.542	-3.416	-2.958	-1.825
$n = 203$	0.909	2.166	1.746	0.037			-1.054	-0.873	-0.827	0.222
	1.214	2.747	1.193	0.171			-4.759	-1.870	-1.991	0.339
$n = 129$	2.677	0.063	6.072	-0.119			-0.718	-1.153	-0.973	-0.454
	3.403	0.080	4.775	-0.535			-3.537	-2.824	-2.536	-0.885
B	10	11	12	13	14	15	16	C	D	E
	$\hat{\alpha}_{10}$	$\hat{\alpha}_{11}$	$\hat{\alpha}_{12}$	$\hat{\alpha}_{13}$	$\hat{\alpha}_{14}$	$\hat{\alpha}_{15}$	$\hat{\alpha}_{16}$	$R^2$	$\bar{y}$	$\hat{\alpha}_3/\bar{y}$
$n = 412$	0.595	0.623	-2.010	-0.777	0.252	0.310	1.449	0.494	2.815	-0.102
	0.790	0.806	-3.733	-1.110	0.337	0.403	1.354			
$n = 265$	0.474		-2.216	-0.707			0.940	0.620	2.566	-0.110
	0.637		-4.027	-0.969			0.954			
$n = 203$	0.462	0.851	-0.970	-0.532	0.514	0.313	-0.186	0.424	2.101	0.018
	0.818	1.334	-2.194	-0.885	1.100	0.647	-0.308			
$n = 129$	0.132		-1.073	-0.097			-0.246	0.618	2.040	-0.058
	0.269		-2.565	-0.145			-0.428			

Explanations of columns:

A and B: Each one of the four regressions is identified by number of observations.

0: Estimated regression intercept.

1: Estimated parameter associated with this year's book value divided by last year's book value.

2: Estimated parameter associated with this year's earnings divided by last year's book value.

3: Estimated parameter associated with dummy for being non-tax exempt.

4: Estimated parameter associated with dummy for year 2000.

5: Estimated parameter associated with dummy for year 2001.

6: Estimated parameter associated with dummy for year 2002.

7: Estimated parameter associated with dummy for raw materials industry.

8: Estimated parameter associated with dummy for manufacturing industry.

9: Estimated parameter associated with dummy for consumer goods industry.

10: Estimated parameter associated with dummy for health care industry other than biotechnology.

11: Estimated parameter associated with dummy for biotechnology (Hi tech).

12: Estimated parameter associated with dummy for financial industry.

13: Estimated parameter associated with dummy for IT hardware and distributors.

14: Estimated parameter associated with dummy for IT except hardware and distributors (Hi tech).

15: Estimated parameter associated with dummy for telecom industry (Hi tech).

16: Estimated parameter associated with dummy for media and entertainment industry.

D: Average market value divided by last year's book value for included observations.

E: Estimated decrease in market value from not being tax exempt.